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DESIGNING A BOARD GAME FOR CHILDREN TO ENHANCE  
WELL-BEING AND TRAIN SOCIAL SKILLS

Thesis

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Title

Designing a Board Game for Children to Enhance Well-Being and Train Social Skills

Abstract

The thesis describes the process of designing an educational board game for school children that enhances well-being and trains social skills. The report includes a literature review on the topic and a description of the practical actions undertaken by the author.

Qualitative research was implemented for the purpose of obtaining information from the target group. Development methods included rapid prototyping and testing. The user-centered approach was followed by the design process.

The result of the thesis is a finalized prototype of a resource management game designed for 7-12 year olds. The game accommodates 3-6 players. The goal of the game for a player is to fill all the slots of a personal progress sheet with resource cards of 5 different types, representing 5 topics: health, emotions, intelligence, hobbies and friendship. Event cards add a twist to the gameplay. The cards contain the descriptions of social situations that children can relate to. Going through different social situations while playing and getting examples of coping with problems provides positive educational impact and empowering effect. At the same, time players train their social skills because the gameplay includes negotiation.

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## 1 INTRODUCTION

The modern world is changing rapidly. Changes for the future world require changes in education already today. What skills and knowledge should we teach to today's children if we do not know exactly what the future will be like? We cannot provide children all the necessary knowledge and skills that they will need in future, and it should not be the aim of education. What we can really do is to cultivate resilient and sustainable personalities that can adapt to rapid changes. We can teach children to recognize their strengths and use them to fulfill their potential for the sake of their personal well-being and well-being of our communities. We can teach the philosophy of growth, abilities to learn, creativity and cooperativeness: the skills that certainly will be appreciated in the future world.

Educational methods have to be revised in light of the needs of the modern world. The current thesis work proposes a solution to the need of raising sustainable personalities: a board game for school children that helps to improve children's social skills and to enhance well-being. A game suits perfectly as an educational method because play is a natural way of exploring the world and obtaining various skills. Games are enjoyable and self-rewarding activities; therefore they are especially good at motivating children to learn.

A board game was chosen, as I believe it is important to encourage face-to-face interaction, which the modern world of devices and social networks often lacks. The game was designed as a strength-based tool giving the idea of what components are important for a happy and successful life, and how one can balance them in an optimal way. It creates a model of life focusing on managing one's personal resources, setting own goals, making choices, balancing different aspects of life, cooperating with others, helping others, creating social relationships and networks, and in the long run thriving to live to one's full potential. Playing the game requires cooperation skills and promotes pro-social behavior.

## 2 FRAMEWORK

To accomplish the goal of the thesis a wide theoretical framework was applied. The matter of game design was explored to understand game design processes, principles and tools. The concept of well-being was described from the perspective of psychology and physiology. The principles and practical guidance for working with children were chosen in accordance with relevant psychological and pedagogical sources. Figure 1 represents the framework and the interrelation of the fields concerned in the thesis.

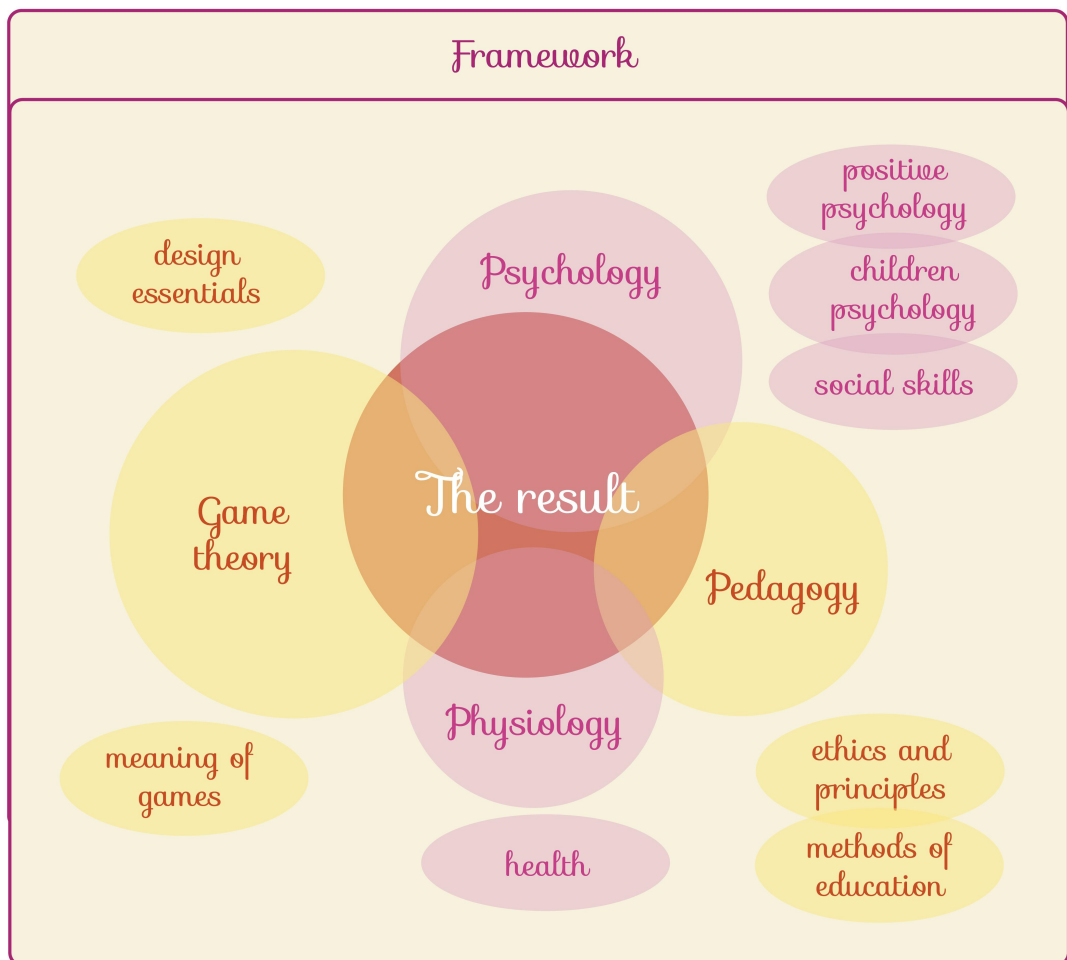


Figure 1. Thesis framework.

## 2.1 Play and games: semantic mapping

Play and games accompany human beings from the cradle to the grave and obviously play a huge role in human culture. It would seem unbelievable that there is any person in the world who does not understand what *game* means and has not played games in her life. Yet when coming to a theoretical discussion of play and games it turns out that the terms are far from easy to define and agree upon. Play and games are being researched from perspectives of different fields, such as psychology, ethology, philosophy, history of culture, mathematics. Different disciplines offer a specific understanding of the phenomena of play and games (Gordon 2007, 2). I do not pursue a goal to create universal definitions of play and game; rather, I am striving to explore the most sensible attributes of play and games when it comes to designing a board game. Therefore, to map the semantic territory of play and games in light of practice-based design project.

In the very beginning it is necessary to make a point about the interrelation of the terms *play* and *game*. These terms are not synonyms; nevertheless, they are not going to be discussed separately in this work. *Play* is a more widely embracing term, while *game* can be seen as one of various methods of play. *Game* is a structured and organized play. *Play* also means process, the implementation of game, as game itself can exist solely in an intangible form (set of rules) or in both tangible and intangible forms (board games, video games) and can be brought to life only in play. Every time a game is played, a unique player experience – *gameplay* – appears. Thus there is an indissociable bond between *play* and *game*.

The attributes of play and games chosen for further review are: freedom, structure, fiction, goal, struggle, uncertainty and engagement. The categories were distinguished according to the criteria of universality, user-focused approach and relevance.

### 2.1.1 Freedom

Freedom can be confidently entitled as a “hallmark of play” (Gordon 2007, 7). As the classic of ludology Johan Huizinga (1980, 8) states, play “is free, in fact freedom.”

Whereas *freedom* is an ambiguous and wide term, it can be regarded from different perspectives in relation to *play* and *game*.

The feeling of freedom and euphoria is well known to all players. In play the borders and constraints of serious life slacken off. One can express oneself in a more free, spontaneous, playful manner. This state of mind is precisely described by Gwen Gordon (2007, 7):

We certainly know it when we feel it—a lightness of heart, a glint in the eye, alertness, enthusiasm, and readiness for surprise. There is a sense of involvement and detachment, self-expression and self-transcendence, individuality and cooperation. Boundaries become fluid, defenses dissolve, and physical, emotional, or mental movement becomes spontaneous, expanded, and well-coordinated.

Behavior that is not permissible otherwise can be expressed in play without fear of consequences; therefore, play becomes the field of experimentation and creativity. In play mental, psychological, and social frames are opened, borders are crossed, giving the feeling of liberation and control, which for many of us means freedom. Vyacheslav Bukatov (2003), a pedagogist and expert in educational games, remarks that games used in classroom should allow children to put their personal implications into play. Otherwise, play elements will be lost, and a game planned by a teacher will turn into something different, rather boring and odious.

As the experience of freedom includes control and ability of making choices, it is necessary to remember that voluntariness is the inherent condition of play (Huizinga 1980; Gordon 2007; Bukatov 2003; McGonigal 2011). The main choice a person makes is the choice to play or not to play and the right to quit the game at any point. As soon as one is forced to play, one is not really playing, but becomes an object of play instead. As Gwen Gordon (2007, 15) observes:

The most immediately distinctive features of play are the freedom it expresses and the agreements and cooperation among playmates. Play stops when participants are not free to play or not, become objects of play, or are unaware that they are involved in play. War, violent crime, and practical jokes may be play for the perpetrators, but it certainly is not for the victims.

Regarding freedom I cannot but mention the dichotomy of *work* and *play* represented particularly in Western culture. Play is most commonly seen as activity carried out during leisure time; therefore, play is non-obliging and voluntary, contrary to work and



studies. In the frame of the dichotomy, play and games are also attributed as not serious and non-productive activities, which nowadays has become a matter of discussion. Some researchers believe that the dichotomy per se is out-dated and needs to be reconsidered in light of rapidly increasing number of phenomena existing on the border between work and play, not to talk about the integration of play and study (Lauteren 2007). Games are step by step conquering their merited place in the “serious” spheres of life, repulsing the stereotype of games as idle pursuit. The evolutionary meaning of play closely connected to learning and acquiring skills is nowadays unquestionable, which opens new horizons for the future use of play and games for the sake of progress. (Koster 2005; Gordon 2007; Ferrara 2013.)

In summary, freedom in its various aspects lies at the core of play experience. Freedom in play/game includes voluntariness, emotional, mental and social liberation, stepping out of borders, experiencing control, and the possibility to make choices. To design a good game one has to think of it as of an “exercise of our own freedom”, providing opportunity for players to set their own goals inside the game frame, to express wills and put personal implications into play (McGonigal 2011, 149; Fullerton 2008, 9; 35; Costikyan 2002, 20; Bukatov 1997).

### **2.1.2 Fiction**

It is an uncontestable fact that play and games entail fiction, which is a common feature for play/game and art. If one observes children playing, she can most often hear the phrase “let's pretend.” Whether a game imitates the “real” world precisely or goes deeper into the world of fantasy, players are always guaranteed that “it's only a game.” The world of playground is separated from the “real world” creating its own endogenous meanings (Costikyan 2002, 22). A player is aware that game elements lose their values outside the game. For example, Monopoly money is of no use except in the game itself (Costikyan 2002, 22). Thus, a game is a different reality. According to Huizinga (1980, 9) the secludedness of play within certain time and place is one of its main characteristics. Play exists within and forms a so called “magic circle.” It is necessary to note that Huizinga's concept of “magic circle” is being criticized, as in the modern world there are games or game elements that integrate and pervade into the “real” world (Lauteren 2007).

Although play and games have their own endogenous meaning, they are not disconnected from the “real world” by any means. The fictional nature of play and games is central to its function to serve as a safe training and experimentation ground. In play humans and animals practice real-life skills. According to Raph Koster (2005, 34-35), “games... are iconic depiction of patterns in the world,” which makes them “very fundamental and powerful learning tools.”

### 2.1.3 Structure

As Tracy Fullerton (2008, 91) notes, “play can be thought as freedom of movement within a more rigid structure.” Both free play and games are structured (Costikyan 2002, 18). Although there are no rigid rules in free play, participants have to agree upon the logic of play, develop their common language, goals, values and meanings of play, otherwise play as interaction will not succeed. Let us take for example two children playing together on the beach. If one strives to build, develop and embellish her sand city, while another wants to play the catastrophe that destroys the city, it will be difficult for them to have a good time together unless they can find a way to combine their goals and interests into one scenario. The act of destroying would be an enjoyable and meaningful part of play for one, while for the other it would be nothing but destroying the play.

Unlike free play, which is in substance spontaneity and improvisation, games have a more rigid skeleton with rules as its base. Rules are basically the mechanisms of the game world functioning. Game designer Greg Costikyan (2002, 21) suggests to “think of a game structure akin to an economy, or an ecosystem; a complex, interacting system that does not dictate outcomes but guides behavior through the need to achieve a single goal.” According to Costikyan, the purpose of structure is “to shape player behavior,” but not to determine it. “A good game provides considerable *freedom* for the player to experiment with alternate strategies and approaches; a game structure is multi-dimensional, because it allows players to take many possible paths through the “gamespace” (Costikyan 2002, 20).

Structure makes the game repeatable and reproducible — a structured game can be

passed from one person to another, from one generation to another, becoming a persistent piece of human culture. Besides the set of rules, structure is also contained in tangible game artifacts, for instance, a deck of cards in a card game, a board and tokens for a board game, an executable code for a video game.

To conclude, there is important advice from the game designer Eric Zimmerman (2004 cited in Fullerton 2008, 19) for his colleagues: “To design a game is to construct the set of rules. But the point of game design is not to have players experience rules - it is to have players experience play.”

#### **2.1.4 Goal**

A game cannot exist without a goal. As Costikyan (2002, 11) claims, game is a “purposeful interaction.” A player achieves the goal within the game system according to its rules in a decision-making process.

Most games have an explicit goal - “a set of victory conditions.” But some games “support a wide variety of possible goals,” allowing players to define goals by themselves, for example “The Sims”, an extremely popular video game. (Costikyan 2002, 13.) Players enjoy and appreciate the possibility to set up their own goals, becoming actually co-creators of the game. It is necessary to remember for a game designer that even if a game has an explicit goal and certain victory conditions, it is always beneficial for a better player experience if a game leaves freedom for individual implications and “a bit of free play” (Fullerton 2008, 34).

It is common for games, to the contrary of the “real” life, that the way of achieving the goal is not the shortest and easiest, but challenging and effortful (Suits 1990, 23). Let us take the game of pool as an example. The goal of pool is to place the ball into the pocket. Obviously placing balls first in the middle of the billiard table and then trying to accomplish the task with the help of cue is not the easiest way to achieve the goal.

### **2.1.5 Struggle**

As achieving the objectives in a game is attended with efforts, tension and challenge, it brings forth struggle. Struggle is an inalienable part of play experience through which a player comes to experience mastery and control. As Greg Costikyan (2002, 17) rightfully claims, “We want games to challenge us. We want to work at them. ... We don’t feel any sense of accomplishment, of mastery, of victory, if it comes too easily.” Struggle is not necessarily a result of direct competition (player vs player) – it can be brought into game in different ways. Fullerton (2008, 52) describes seven possible player interaction patterns, where four of them are based on competition between players (player vs player, unilateral competition, multilateral competition, team competition) and three of them are based on competing with players in the game (single player vs game, multiple individual players vs game, cooperative play).

For a game designer it is important to adjust game difficulty to the right level. If a game is too easy and does not require a certain amount of effort, it is boring. If the game is too difficult, it is frustrating. It happens with many games that the lifespan of their appeal to a certain player is limited. As soon as player achieves mastery up to the point where the game is no more challenging, she loses interest in the game. At the same time there are examples of games, such as chess or go, that can be played endlessly. Implying difficulty flexibility can help to embrace a wider target group and to make the game “live” longer, retaining freshness and attractiveness for a certain player for a longer period of time and sustaining more gameplays.

### **2.1.6 Uncertainty**

When talking about the life-span of a game, we can not but mention uncertainty, which is another crucial feature of a game and a key to creating successful game design. The more variations are programmed into a game, the longer it stays interesting. For instance, the game of tic-tac-toe does not have many possible variations of play; therefore it quickly becomes boring. If we take chess, the abundance of possible variations of play provides a great replayability.

The uncertainty of outcome is not less important. People do not play if they know the outcome of the game. If they do, they are probably doing something else than playing. As mentioned before, in games people are seeking to experience control and mastery, which is possible only upon conditions of uncertain outcome and the possibility to influence the outcome (Csikszentmihalyi 1990, 61). There are games that function on pure chance, such as simple race games. According to the research, they are found less engaging and enjoyable than those that provide players the possibility to influence the outcome (TEDx Talks 2012; DeCoster 2013).

### **2.1.7 Engagement**

A game designer focusing on player experience strives to make the game engaging. The content and conditions of the engaging activity certainly differ among different people, which brings up the need to research the target group to get an understanding of what is enjoyable, fascinating, and captivating for the certain group of players. According to the results a designer can make decisions about the means of creating engagement.

The theory of flow by psychologist Mihaly Csikszentmihalyi (1990) illuminates brightly the psychological nature of engaging activities and their beneficial role in a person's well-being. Csikszentmihalyi describes the state of flow as total concentration and deep absorption into the activity. The author points out that the more often a person has a chance to be in a state of flow, the happier and more resilient she becomes. As the psychologist expresses,

First, the experience of enjoyment usually occurs when we confront tasks we have a chance of completing. Second, we must be able to concentrate on what we are doing. Third and fourth, the concentration is usually possible because the task undertaken has clear goals and provides immediate feedback. Fifth, one acts with a deep but effortless involvement that removes from awareness the worries and frustrations of everyday life. Sixth, enjoyable experience allow people to exercise a sense of control over their actions. Seventh, concern for the self disappear, yet paradoxically the sense of self emerges stronger after the flow experience is over. Finally, the sense of duration of time is altered; hour pass by in minutes, and minutes can stretch out to seem like hours. The combination of all these elements causes a sense of deep enjoyment that is so rewarding people feel like expending a great deal of energy worthwhile simply to be able to feel it. (Csikszentmihalyi 1990, 49).

In summary, the engagement level of a game depends to a great extent on the factors that were mentioned in the sections above: freedom of self-expression and personal implications, the possibility to make meaningful choices and decisions that influence the uncertain outcome, support for a wide variety of goals, adequate difficulty level and challenge.

As a result of the semantic exploration of the world of play and games in light of practical needs of the current project, a semantic map was created (Figure 2). The map visualizes the chosen attributes of play and games serving as knowledge base for achieving a successful result – a user-centered, engaging, emotionally and intellectually appealing game design.

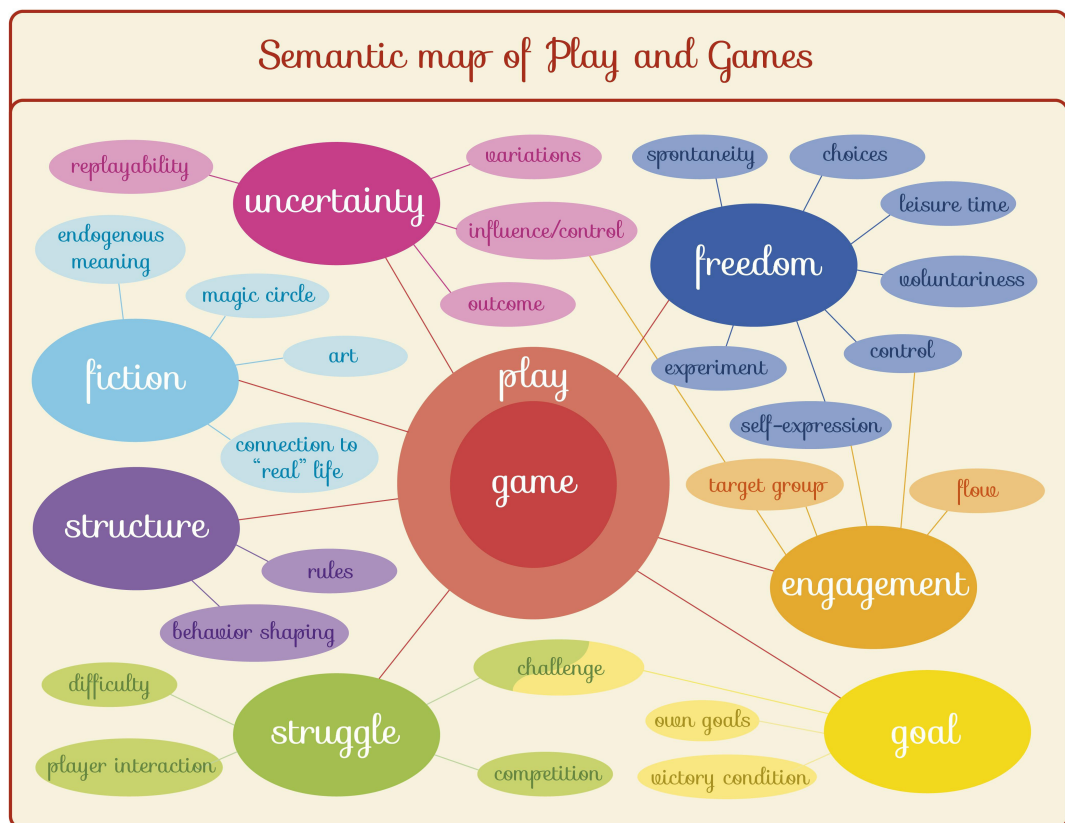


Figure 2. Semantic map of play and games.

## **2.2 Well-being**

According to the Oxford English Dictionary (2016), well-being is, “the state of being healthy, happy, or prosperous; physical, psychological, or moral welfare.” In the current thesis project well-being is regarded as physical and psychological welfare in inseparable connection to each other. The vision of well-being for this project was formed and influenced by positive psychology, Carol Dweck's theory of mindset, Yuliya Gippenreiter's practical psychological guidance, and Karen Neff's works on self-compassion. The up-to-date research on health issues was utilized considering physical welfare.

### **2.2.1 Psychological welfare**

The project is to a great extent oriented to the principles and practical instrumentarium of positive psychology. Positive psychology can be called the science of happiness. It has developed as a complement to the traditional psychology, which has been focusing more on pathological states of human mind. Positive psychology for its part is aimed at researching the positive side of the human mind stating such questions as: what is happiness, can it be measured, how it can be achieved, how people can live their lives to the fullest? (Ben-Shahar 2006; Csikszentmihalyi 1990; Seligman 2012.)

Martin Seligman (2012), the originator of positive psychology, answers to these questions with PERMA theory, where P stand for positive emotions, E for engagement, R for relationships, M for meaning and A for accomplishment. Positive emotions are important for well-being, but at the same time one has to take into account that they are momentary and have a short-term effect on satisfaction with one's life. Life is not all sunshine and roses. More than that, negative emotions and feelings are a rightful and inescapable part of human life. Allowing oneself to experience and express the negative spectrum of emotions as well as the positive one is giving oneself the right to be human (Ben-Shahar 2006). Besides that, Seligman admits that the number of positive emotions a person experiences is based more on genetics than on the surrounding environment or a person's efforts to get more positive emotions; thus positiveness cannot be

significantly increased by external measures. The good news for those who want to make their lives happier is that other components are more sustainable and yield to personal choices and decisions; therefore, one can certainly change one's life making it happier, more fulfilled and meaningful. (Ben-Shahar 2006; Csikszentmihalyi 1990; Seligman 2012. )

Positive psychologists claim that there are certain attitudes that affect the level of happiness and fullness of life. Positive thinking is essential for building resilience: the ability to cope with problems, stresses, and traumas (American Psychological Association 2016). There are different ways of building the resilience. Two important factors, for example, are optimism and gratitude. (Ben-Shahar 2006; Seligman 2012.)

Optimism is a way of reacting to positive and negative events. When something bad happens to an optimist, she believes that it is an accident and it is not likely to occur again. When something good happens, an optimist perceives it as a regularity and believes that it will happen again. Optimism is a healthy habit that helps people to stay in a good psychological and even physical shape. (Seligman 2012.)

Gratitude is the ability to be thankful for the good things one has and not taking advantages for granted. First of all, gratitude makes people notice all the positive aspects of their lives that are so often overshadowed by problems and stresses. Secondly, gratitude creates a meaningful connection between an individual and the world. Small everyday exercises in gratitude are able to make big changes in a person's mental state. (Ben-Shahar 2006.)

Positive social relationships are extremely important for a person's well-being. For children the main source of support, love, affection is of course, the family, the relationships with significant adults. Children need the nourishing environment of safety, love and acceptance to grow strong mentally and be able to meet the stresses and challenges of life. Adequate self-esteem is the psychological basis for personal growth and development. Children learn thinking patterns from the adults' attitudes and reactions to their actions and their personalities. Parents have the strongest influence on a child's attitudes and mindset. When children start school education, another strong



source of influence appears – the teachers. Teachers have the possibilities to encourage children and help them to believe in their strengths, or otherwise, which happens sadly too often, to make children feel themselves stupid and useless. I believe that the primary objective of school education should be the support of the personal growth of students: their ability to learn, solve problems, set own goals, adapt to different situations and manage their lives, rather than trying to load the given amount of knowledge into students' heads. It requires a certain level of psychological literacy and appropriate educational tools. One of the main purposes of this thesis work is to create such a tool that can help adults in families, schools and other institutions to teach children well-being and at the same time establish deeper relationships with them. (Gippenreiter 2003; Goldstein 2013; Dweck 2007; Korczak 1967. )

### **2.2.2 Physical welfare**

Physical aspects of well-being include health and safety. The game designed within this thesis work focuses preeminently on health issues, such as healthy lifestyle and habits, including nutrition, sleep, exercise, day regimen. Although it is the parents who are responsible for the decisions dealing with children's health, it is crucial to teach children to make their own healthy choices independently in their everyday lives. Children at the ages of 7-12 years old are getting more independent and start making their own decisions that affect their health. For example, they might spend their pocket money on junk food or spend their free time indoors in a passive way. Parental control varies from family to family, but in any case, children will grow independent some day, and they will earlier realize their own responsibility for their health, the better.

Healthy nutrition for children has to meet the needs of a growing organism. The essentials of a balanced diet are sources of protein, healthy carbohydrates, healthy fats, fiber, vitamins and microelements (British Nutrition Foundation 2016). Food that contains a high amount of sugar and sodium and highly processed food, such as candy, chips, soda drinks, have to be avoided (British Nutrition Foundation 2015). Drinking enough water is not less important. A child needs about 6-8 glasses of fluid per day, and these should be preferably water. (British Nutrition Foundation 2013.)

Sufficient sleep and rest are essential for healthy functioning and development. According to the National Sleep Foundation children at the ages of 6-13 are recommended to sleep about 9-11 hours per day. As the need varies individually and depends on many factors, for some children 7-8 hours might be appropriate while others will need as much as 12 hours. Sleeping less than 7-8 hours at that age will certainly have negative consequences. (National Sleep Foundation 2016.) The ways a child recovers and how she spends leisure time matters significantly. For optimized functioning one needs to follow a well-planned day regimen with interchanging types of activities. Thus, physical activity can help to recover from a mental load and vice versa. Besides varying activities, one has to remember to reserve time for full relaxation. In the perspective of a modern lifestyle that lacks outdoor and physical activities it is highly recommended to motivate children going and playing outside during their leisure time instead of, for example, playing video games or watching television. (ParticipACTION 2015.)

The human body is designed to be physically active; therefore, a sedentary lifestyle can be considered as the epidemic of the modern world. It negatively affects children as well as adults. Exercise can be incorporated into a child's everyday life in different ways, beginning with attending sport or dance classes and ending with everyday healthy habits, such as using stairs instead of an elevator, biking and walking instead of driving or using public transportation. Last but not the least, children should have the possibilities and should be encouraged to spend time with their friends outside, being exposed to fresh air, sunshine, playing active games, running, jumping, crawling, climbing, fooling around and having fun in their own ways. (ParticipACTION 2015.)

As already mentioned, physical and mental health are closely interconnected. As said in a popular Latin phrase, "*Mens sana in corpore sano*" or "Health mind in a healthy body." Exercise has been found to have a huge effect on mental well-being, helping to control the mood and treat depression (Ilardi 2013). On the other hand, positive attitudes and high spirits help people to feel physically better and survive severe diseases, such as cancer (Glanz & Schwartz 2008, 221). Furthermore, psychological suffering and stresses ultimately affect one's physical condition. In reference to the above, well-being should be regarded from a holistic approach.

### **2.3 Games making life better**

While games and play are an inalienable part of life they are often underestimated and even branded as idle, useless pursuit (McGonigal 2010; 2011; 2012). More than that, some types of games are considered to be harmful. Video games, online games and gambling games are in a bad repute. These types of games are usually connected to violent behavior, addiction and various negative consequences dealing with gamers' immoderate intentions to escape from the real life. Although the negative side of games certainly exists, the positive side cannot be denied and diminished. In this chapter we will review important functions of play and games and the potential of games to make real life better.

While play and games have benefits for people of all ages, it is undoubtedly recognized that children have the inherent right and need to play. According to the International Play Association's (2014) Declaration on the Importance of Play:

Playing is a vital, universal behavior, essential for children to be children and thrive in the modern world. Play is a fundamental part of life; it is a biological, social, cognitive necessity for individual children, but also has benefits for society and the human species.

The possibility to play is a crucial condition of a child's physical, mental, emotional and social development. Children's play should be regarded as means of living, not mere leisure time. IPA (2016) is worried about society's indifference to the importance of play and proposes that play has to be better integrated into health care, education, family and community life. It is necessary to understand that play does not distract children from preparing for adult life. On the contrary, it supports future achievements and trains essential life skills. Not allowing children to play has a devastating effect on their development. Play deprivation might result in depression, aggression, anti-social behavior, repressed emotions, inactivity, and adapting of less healthy lifestyles. IPA claims that deprivation can even affect the following generations; therefore, recognizing the importance of play and providing a healthy, enriching environment for children is a question of our species' well-being and flourishing. (IPA 2014; 2016.)

The first and self-evident function of play and games is the recreational function. According to the Universal Declaration of Human Rights (1948), leisure is considered to be a human right. Games as leisure activities provide relaxation and positive

emotions: fun, enjoyment, amusement, pleasure, which are important for a person's well-being (Seligman 2012). Although the recreational function of game is itself important, games have much wider meaning and potential.

Without any doubt games are a powerful learning and training tool. It is the nature of play that provides the possibility to learn while playing. According to psychologist Jean Piaget (1967; 1969 cited in Corbeil 1999, 166), learning involves two activities – exploring and imitating. Besides that, learning has to involve reward to motivate the individual for making efforts. Play helps to learn as it includes all three necessary components: exploration, imitation, and reward. (Corbeil 1999, 166-167.)

Raph Koster finds that the processes of playing and learning have similar characteristics rooted in the nature of the human brain's cognitive functions. While processing data from the sensory organs, the brain searches for patterns and cuts out all the irrelevant details. The learning process is dealing with recognizing new patterns and creating new neuron paths in the brain. The human brain is naturally curious and craves for stimuli: it enjoys learning. According to Koster, games are "concentrated chunks" that can be easily absorbed by the brain; therefore, playing is closely connected to learning, comprehension, and mastering skills. Koster analyzes how games teach life skills and concludes that, "games are practice for the real world, and when the game stops teaching us, we feel bored" (2005, 12-99). While games are teaching skills that might be useful in real life, there is no fear of real consequences, as "it is only a game", which makes the learning process effective and safe (Corbeil 1999, 167).

The majority of educational institutes nowadays includes play and games into their programs to some extent. The use of games in education is widely recognized, but it is in major cases underestimated due to the stereotype that games in the first place belong to leisure time, not to work or school. It seems that many educators associate education with inescapable boredom. In other words, students have to do all the boring tasks for the purpose of "real studying", but from time to time they are rewarded by having a bit more fun while playing educational games. In my opinion, such an approach is deeply flawed because the real nature of learning is opposite to boredom. Games have a much wider and stronger potential in education. As an example let us consider the Østerskov Efterskole, a Danish school that bases its whole curriculum on role-playing. Hyltoft

(2008) reports that teaching methods of Østerskov Efterskole have shown high effectiveness, and the students' academic achievement level is competitive in comparison to more traditional schools.

Play and creativity have much in common. A playful and relaxed state of mind is required to start thinking outside the box. Consequently, playing games can train problem-solving skills. And when taking the following logical step, we can assume that games themselves can serve as problem-solving tools. Game designer Jane McGonigal ambitiously states that games are going no more, no less to save the world. According to McGonigal, gaming is a new evolutionary stage of humanity. She believes that if optimism, cooperativeness and blissful productivity that people demonstrate while playing online games were turned to the real world instead, people could find solutions to the wicked problems of our time. (McGonigal 2010.) Games give us a useful lesson in how to make the reality more rewarding and motivating. The future belongs to games that reconnect people to the reality and help them to solve the problems of the real world, not to run away from them. (McGonigal 2010; 2011.)

#### **2.4 Target group**

Children from 7 to 12 years old were chosen as the target group. This age is characterized by active growth and development of body and mind.

Children's bodies grow intensively: muscle mass grows, baby teeth change to adult teeth. The motor cortical center in the brain becomes more active. Coordination and fine motor skills improve. Muscle strength and resilience increase. Children are able to master complicated activities, such as sports, dancing, playing musical instruments.

Intellectual abilities grow as well. Children master language learning to convey their thought and opinions in a distinct way. Concentration, attention, and memory increase. Children at the age of 7-12 become more and more independent from parents, seeking the approval of peers and other adults, such as school teachers. At this stage self-esteem plays a significant role in the child's mental development. Friendship and relationships with peers is an important part of a child's life. Social relationships are embodied in

play. While playing, children explore rules and the norms of the society. Cooperation skills and self-control can be named as the most important results of a child's mental development for the period of 7 to 12 years. (Dubrovinskaya et al. 2000.)

### **3 GAME DEVELOPMENT**

The design process started from the background theoretical research that is presented in the previous chapter. The obtained knowledge allowed to specify the goal and plan the following actions. Game development included the following stages: obtaining the information from representatives of the target group in the form of a workshop, collecting inspirational materials, ideation, early rapid prototyping and testing, evaluation, improvements, finalizing the design. The process is not linear, as the designer can go back and forth from one stage to another. At the moment of writing the thesis report the game development was not finished. I am planning to conduct more playtests with the finalized version presented in this report. It is expected that the need for further improvements might be detected while testing.

#### **3.1 Goals and educational objectives**

The goal of the thesis project was to create a user-centered, engaging, emotionally and intellectually appealing game design. The main purposes of the game are educating, empowering and entertaining children. Besides that, it can serve as an observation tool for adults. According to the knowledge base presented in the previous chapter the list of educational objectives for the game was set. The players are supposed to learn to:

- ✓ Maintain physical and mental health/ to be healthy and happy
- ✓ Manage own physical and psychological resources

- ✓ Manage stress
- ✓ Rest and recover from physical and mental loads
- ✓ Learn to express feelings and emotions
- ✓ Understand the emotions and feelings of others
- ✓ To accept oneself and others
- ✓ Provide emotional support to oneself and others
- ✓ Seek support and help when needed
- ✓ Be open to learning new things
- ✓ Perceive both successes and failures in a constructive way
- ✓ To take active and positive attitude to life and its challenges
- ✓ Not to be afraid of mistakes
- ✓ Communicate and negotiate with others
- ✓ Balance own and common interests

### **3.2 Project partners**

The thesis project was done in cooperation with two organizations that work with children: Suvenlahti, based in Joensuu and Planik, based in Petrozavodsk, Russia.

Suvenlahti is a center of supplementary education and leisure activities for Russian-speaking children in Joensuu. It offers courses for children such as art, dance, theater, handicrafts, music, and it organizes events for children and adults and supports Russian language. Suvenlahti kindly provided help with organizing workshops with children for the purpose of obtaining background information and play testing the game.

Planik is a social enterprise that produces means of visual communication for children. The enterprise specializes in visual products for autistic children, who have communication difficulties and sometimes do not speak at all. Besides that, their product range includes products for children without special needs, for example, visual timetables for preschoolers and school children, educational toolkits. The cofounders and specialists of Planik, Darya Berezina and Natalya Nikulina, provided priceless feedback for the project during the design workshop and play testing session. There are

plans for further cooperation with Planik considering the production and distribution of the game in Russia.

### **3.3 Obtaining information from the target group**

To create a user-focused design one has to include interaction with representatives of the target group beginning from the earliest stages. To create a good game design for children it is necessary to meet children: talk with them, ask them what they like and dislike, listen to them, observe them and play with them, as play is a natural way of interaction with children. For that reason, I planned a workshop with children in the form of a game. The results of this served as a starting point for the design process.

The main purpose of the workshop was to see how the topic and terms of well-being are perceived by children. I had initial ideas on the ways the material could be presented, what educational material would be included and in what forms. It was necessary to see the children's reaction. The workshop was designed to get a better understanding of how to present the information in a manner understandable and accessible to children.

The workshop was organized in cooperation with the partner organization Suvenlahti and took place on 12.11.2015 in Joensuu. Two boys (9, 10 years old) and four girls (9, 9, 9, and 10 years old) took part in the workshop. The meeting included an introduction, playing, debriefing plus collecting oral feedback and refreshments. The workshop was captured on video for my personal use to provide the possibility for further revision and analysis of the results.

For the game children were divided into two teams by lot drawing. Each team had to accomplish three tasks and to obtain as many points as possible. The team that gained the most points for all the tasks won.

The first warm-up task “Associations” was to give associations with given words. Each team had one minute to give as many associations to a word written on a card as possible. The team got a small soft ball, which they passed from one to another. The person who got the ball named one association word and passed the ball. The given



words dealt with the mindset concept. Besides that, there was the word “game” added with the purpose of getting an idea of what games mean to children. The other words were: mistake, success, problem, self-assurance, support.

I must admit that the first task was a failure. Either it was too difficult or boring for the children, but they were stuck and got frustrated. After the first child gave his/her association, the others tended to stick with his/her word and name very closely related or almost similar words and phrases or even repeat the ones that were named before, for example the associations with “self-assurance” were “I will manage,” “You will manage someday,” “I can do it.” “Mistake” and “support” turned out to be the most puzzling words to give associations with. Having analyzed the results, I came up with two possible reasons why the first task failed. Firstly, it was a mistake to expect 9-10 year-old children would deal with abstract words without any preliminary discussion or preparation. Secondly, I should have given more concrete instructions with concrete examples of associations.

The second task “Charge your batteries” had the intention of teaching children effective and healthy recreation methods. Each team got 16 cards naming leisure activities and habits such as “to watch TV,” “to play with the dog outside,” “to have a nap” (Appendix 1). The team's task was to discuss the methods of relaxing and resetting and to choose the ten best. Each activity was assigned points from 0 to 2. The total points were counted, and the choice was discussed together with all the children. The team that got the most points for this task got one point to the main score. The accomplishment of this task went much better than the previous task. Children were engaged in the process. A hot discussion took place while the teams were deciding upon their choices. This experience proved that it is really important to provide children with specific information, and concrete examples and facts.

The third task “Alien kitten” dealt with the concept of mindset by Carol Dweck. The goal of the task was to teach children to keep a growth mindset instead of a fixed mindset in different situations. In a fixed mindset people believe that their talents and intellectual abilities are given entities and can not be changed or improved. A fixed mindset contains a fallacy that achievements are the results of unchangeable abilities, but not the efforts put into the challenge. Fixed mindset adherents strive to seem smart

instead of working on getting smarter, because they simply believe that smartness is a permanent quality and cannot be trained; therefore, they are afraid of making mistakes, asking “stupid” questions, taking new ways of solving problems. At the same time, such people can show higher levels of anxiousness, lower self-esteem and self-acceptance, as they do not give themselves the right to make mistakes and to fail, which is, in fact, inevitable and normal. The growth mindset is based on an understanding of nature of learning and brain functioning. All abilities can be trained, moreover, pure talent or ability without hard work does not automatically bring any results. The growth mindset includes an adequate evaluation of one's mistakes and failures. First of all, one has to focus on the objective reasons for the failures instead of unproductively blaming oneself. Secondly, it is necessary to remember that mistakes are a normal part of the learning process; therefore, every mistake is a chance to improve. Thirdly, learning is an individual process. One should be concentrated on her own progress and not on the results of others. (Dweck 2007.) Regarding the right attitude towards failures, Carol Dweck offered to use a simple, but powerful word, that contains great shift of meaning – the word “yet”. Rather than claiming “I cannot manage with this task,” it is much more positive and wise to say “I cannot do this YET”. (Dweck 2013.) Besides the attitude towards failures, the growth mindset also means that the achievements of oneself and others should not be taken for granted. Therefore, saying or thinking “I have succeeded because I am so smart/talented” is a mental trap, as it brings fear of falling off the “smart guy's” pedestal, thus restraining further development. (Dweck 2007.)

In the task “Alien kitten” I suggested imagining that each group of children had got a pet from the outer space – an alien kitten. Each team got a picture of their Kitten. The Kitten was a curious little creature much like a child. As every child, the Kitten was attending school and had hobbies. The team's task was to care about the Kitten's mindset and self-esteem in different situations, staying realistic, positive and supporting. Situations and possible reactions to them were written on cards. (Appendix 2.)

While observing children doing this task, I noticed that they were engaged in the discussion. The situations were clear and familiar. In their choices children showed the ability to be compassionate and supportive. After the choices were made we discussed them together. Children agreed that support and acceptance of another person is

important, as well as helping her/him to keep the growth mindset. I suggested that it would be also helpful to try treating themselves as they treated the Kitten. If it happens that there are no supporting people around, a person can (and should) always be kind and supporting to herself/himself.

In the end after the score was counted we had a short debriefing phase. I asked children to tell what they learned from the workshop and was it fun or not. Their answers affirmed my presumption that the tasks № 2 and 3 had positive learning outcome and children enjoyed the activity. The workshop justified that the topics of physical and emotional well-being are interesting and important for children. I got a better understanding of how the educational material has to be presented to be accessible for children: it has to be very concrete and contain examples and life situations that are familiar to children.

### **3.4 In search of inspiration**

Collecting inspirational material is a highly important part of the design process. It can be compared with preparing fruitful soil from where the plant of the design will grow. The better and richer the soil, the more viable design will be. As Fullerton (2008, 83) admits, “the more you find inspirational sources that come from areas beyond the spectrum of your intended medium, the more unique your creations will feel to others”. The source of inspiration can come from anywhere. When a designer is immersed into the project, the process of searching for inspiration is non-stop. The designer's mind receives and filters all the experiences and impressions flowing in from the environment, thoroughly picking out the material suitable for the project. The designer also addresses her internal world, bringing up the archives of own memory and background, searching for inspiration.

Nevertheless, the sources within the field should not be forgotten. As the topic of game design was new for me, I faced the necessity of the intensive exploration of the world of games and game design, reading literature, watching videos, talking to people about games.

I got acquainted with various games that influenced my vision of the project. I would like to mention four of them from which I borrowed ideas and features to be transformed and remelt into a new design concept.

#### **3.4.1 Work ability game by Juhani Ilmarinen Consulting**

The work ability game is a product developed by Professor Juhani Ilmarinen's work ability consulting company for use in corporative training. Juhani Ilmarinen Consulting Ltd. develops card and board games on the topic of work ability. The games are based on the work ability house model developed by the Finnish Institute of Occupational Health (Helsinki). The image of a house stands for person's work ability, and the dimensions of work ability are depicted as the floors of the house and its surroundings.

I had a chance to get acquainted with Professor Juhani Ilmarinen's work ability card game and try it out when he visited Karelia University of Applied Sciences 27.10.2014 with a seminar. The card game is made on the basis of a standard French 52-card deck. The goal for players is to collect series of 3 cards consisting of cards of the same rank or a sequence of cards of the same suit. Each card has a question, which is answered by players when they take cards from the deck by turns. The purpose of the questions is to bring the issues of work ability to discussion. It is a good start for a company to start a dialogue between workers and management to improve work ability and enhance well-being at workplaces. (Ilmarinen 2014.)

#### **3.4.2 SuperBetter by Jane McGonigal**

SuperBetter is an online game that helps people to “achieve personal growth and tackle real-life challenges”. Superbetter is a universal tool of support to cope with a wide range of life challenges, starting from adopting a new habit and ending with overcoming depression. As it is claimed on SuperBetter website:

SuperBetter is a gameful way of living to be Stronger for life. Living gamefully means bringing the same psychological strengths you naturally display when you play games – such as optimism, creativity, courage, and determination – to your real life.

Based on scientific data, SuperBetter has proved its effectiveness in clinical studies. According to the studies SuperBetter "reduces symptoms of depression and anxiety, increases optimism, social support, self-belief, improves mood and strengthens family relationships during rehabilitation and recovery". (About SuperBetter 2016.)

In SuperBetter a player has her own profile, similar to a social network profile. The player sets her/his goal (or Epic Challenge), accomplishes Quests, activates Power Ups and fights Bad Guys to become stronger and increase resilience. SuperBetter is designed to build four kinds of strengths: physical, mental, emotional and social. Unlike traditional online and computer games, SuperBetter does not alienate players from real life, but on the contrary helps to reconnect with reality, as tasks are to be done in real life. For example, one of the quests requires that next time when the player is outside the house she/he should not gaze at the ground, but look at the people around, smile at them, notice what will happen, and keep a journal.

### **3.4.3 Catan by Klaus Teuber**

Catan by Klaus Teuber is an extremely popular board game acknowledged by players and specialists in the field. Catan or The Settlers of Catan is a board game where the players' task is colonization of the uncharted island of Catan, using natural resources to build their settlements, roads, and cities. The playing board is assembled of hexagonal pieces that refer to different types of terrain. Each terrain produces a specific resource, for instance, pasture produces wool, and forests produce lumber. The pieces of the board can be reassembled in a different order for each gameplay. It provides a high variability of territories and helps to recreate the situation of colonizing a new, unexplored territory. Players are involved in active trading of the resources according to the needs of their building projects. The winner is defined by victory points – the goal is to gain 10 victory points first to win the game. (Catan 2016.)

### 3.4.4 Psychological games by Juliya Gippenreiter

Professor Juliya Gippenreiter is a Russian psychologist and author of popular books on children psychology aimed at the non-specialist audience, especially parents. Gippenreiter's books can be described as practical, rich in concrete examples and guidance, and easy to read. Gippenreiter also designed educational games, such as “Our feelings” (*Nashi chuvstva*), “Emotional lotto” (*Emotsionalnoye Loto*). The games teach children to recognize the emotions and feelings of themselves and other people and to tell about their own emotions and feelings. “Emotional lotto” is a variant of a bingo game. In the beginning of the game players get personal boards with five or six images representing emotions. Then players get cards with the descriptions of emotions by turns and if the description matches with the picture the player covers the picture up. The goal of the game is to cover the all the pictures first. “Our feelings” in my point of view is not technically a game as it does not have the structure of the game – it does not have a distinct goal, does not involve struggle to achieve that goal and there is no victory condition. Players get cards with life situations that trigger certain emotions and feelings and they have to tell in what cases they experience the same emotions and feelings. “Our feelings” is a useful practical tool for children and adults to create a deeper relationship and mutual understanding. (Gippenreiter 2014.)

Although I refer to the existing games as the source of inspiration, my design concept should be regarded as a unique entity, as I used ideas and features from the existing games to develop my own vision and to solve the set problem in a new way. The work ability card game spurred me to work on a game solution for the problem lying in the sphere of well-being and works as an educational tool. It provided a good example of how educational material can be integrated into a game in the form of questions and how to provoke fruitful discussion in a relaxed manner. Jane McGonigal's SuperBetter was an inspiring realization of an idea that games are able to change people lives for the better. As with Jane McGonigal in SuperBetter, in the design project I adhere to the strength-based approach and the principles of positive psychology. Catan brought me to the understanding of what kind of experience I want to offer to my players – dynamic, socially rich, requiring strategical thinking to some extent, but at the same time relaxed and easy atmosphere. Professor Gippenreiter's games have a strong basis in applied

psychology. They serve as a feasible example of introducing social and emotional situations and give possibilities to train social and emotional competence in children and adults. In the project I am striving to combine the best features of all of the eminent game examples mentioned before in a unique creative solution.

#### **4 RACE GAME**

The race game idea was the first to be developed. Race game is a type of game where players move tokens along the track striving to finish first. Race games are the earliest board games known in history and also the most widely spread (Parlett 1999, 34). It was decided to choose this type of game because it is well known to children and the course of the game is comprehensible and intuitive.

The track would symbolize the course of life with its positive and negative events, advancements and setbacks. A person possesses resources and strengths to cope with life difficulties and move forward. I wanted to include cooperativeness into the game, though with this naturally competitive type of game it was not so easy to find an appropriate way to do it. The educational material would be included in the form of questions that provoke discussion.

The first version of the race game includes a board with a track, tokens, dice, resource cards of two types – hearts and smilies, representing physical and psychological condition respectively, and power-up cards. The goal of the game is to come to the finish first retaining at least one resource card of each type.

Roll-and-move is traditionally the main play mechanism in a race game. Players take turns throwing the dice and moving their tokens forward in accordance with the roll. The track contains areas that are followed by additional actions, for example, stopping on a certain area player's token can mean being pushed back or forward, or the player might lose her/his resource cards or get a power-up.

The function of power-up cards is to regain the lost resource cards. Power-ups are not identical to the resource cards. They are meant to be exchanged for the resource cards. In order to get power-up cards players were supposed to answer questions or accomplish tasks. The player can decide if she/he wants to use power-up by herself or to donate it to other players. If a player loses either all of the hearts or all of the smilies, she/he is eliminated from the game. Although players are opponents in the game, an interconnection between them was designed. If one of the players is eliminated from the game, another loses one of her/his smilies. The idea behind this rule was to promote pro-social behavior. Players would get the idea that everyone is responsible for her own well-being, but also responsible for others and should offer help if it is possible. The intention was to leave the freedom of choice to players. They players are not forced to help by the rules, but there might be a benefit for them if they dedice to help; on the other hand, refusing to help can be beneficial as well. According to Ferrara (2013, 301) when designing a persuasive game it is important to leave the freedom of choice. To provide real freedom of choice wrong choices should have some advantages as well as right choices because if the choice is obviously not beneficial, it will not be considered as a choice at all. The situation with no choice can hardly teach anything. Therefore, I strove to design a game that imitates real-life situations of making choices and balancing interests.



Picture 1. Race game crude prototype: board and "tokens". Picture 2. Race game early playtest using crude paper prototype and online dice.

After the initial concept of the race game was created, the development started with designing the game mechanics and early testing. Design and testing was done simultaneously. Crude prototypes were created of used one-side printed paper. I utilized coins as tokens and an online dice roll simulator, as I did not have proper tokens or dice



on hand (Pictures 1 & 2). The game was designed for two players. During the earliest playtests I was played on behalf of both. The later tests were done by two people.

Early playtesting was free experimentation with game parameters such as:

- the length of the track (number of steps) and its shape
- the number and location of negative event zones ("traps") on the track number and location of power-up zones on the track
- the number and location of areas that make the token move back or forward ("jumpers")
- the initial number of resource cards

Many variations were tested throughout the experimentation. All playtests were documented. The information on each turn was put on paper. Information included dice number and the player's actions, such as moving the token forward or backward, losing the resource cards, getting power-ups, exchanging power-ups for resource cards. While tasks and questions were not designed yet at this stage of development, the acquirement of power-ups was determined by dice roll: an even number stood for a positive outcome and uneven number for a negative one.

The aim of the early game development was to create smoothly working game mechanics. Creating the uncertainty of the outcome and balancing the chances is essential. At first attempts the gameplay was not balanced, and it often occurred that nobody became the winner: both players were eliminated due to the loss of all resource cards. It had to be fixed because such a gameplay is extremely frustrating for the players.

22 testing sessions were accomplished manipulating the parameters and the rules. The evolution of the game's board in early crude prototypes is presented in Appendix 3. The final version included a track divided into 80 steps. I decided to refuse the initial idea of marking the areas with a positive or a negative event and added another pack of cards that contained events. In the final version when a player's token stops in the event area, she/he takes an event card that specifies the action – either the player loses one of her/his resource cards or gets a power-up. There are 40 event cards altogether: 10 lose heart cards, 10 lose smiley cards, 10 smiley power-ups, and 10 heart power-ups. I managed to achieve a satisfying result through the tests with crude prototypes, and the

next steps would be designing the educational content in the form of tasks and questions, creating a more finalized prototype, and playtesting with the target group. However, it was decided to put the race game idea aside and to return to the ideation phase to generate ideas for a new concept.

I realized that the race game does not allow the embodiment of the goals of the project. Firstly, it did not encourage communication between players; therefore, it could not help in training social skills. Secondly, the elimination of players was not a good idea. It is frustrating and boring to sit on one's thumbs when eliminated from the game and wait until one's opponent finishes the game. (Liberty & Spak 2012.) For these reasons the race game was not developed further.

## **5 RESOURCE MANAGEMENT GAME**

### **5.1 Resource management game concept**

Resource management game is a type of tabletop game where players have to collect and manage resources. Negotiation is commonly an important part of resource management games. This type of game perfectly suits the fulfillment of the educational goals because the resource management skills are essential for one's well-being. A person that is aware of the resources she has and knows the smart ways to use them is able to live life to her full potential. At the same time, I wanted to include cooperation mechanisms into the gameplay. The main idea of the game can be expressed as: "Take good care of yourself, but don't forget to help and support others."

The goal of the game is to collect personal/resource cards of different types. Each card type covers a certain topic. The topics for the cards were chosen in light of the essential components of a child's life, taking into account physical and psychological well-being, possibilities for personal development and growth, social competence. There are five personal/resource card types in the game: 1) health, 2) emotions, 3) intelligence, 4) hobbies, 5) friendship.

The topic of health touches upon questions of healthy lifestyle (healthy food, exercise, sleep and rest, appropriate clothing) and safety. It brings up the examples of making healthy choices.

The topic of emotions concerns the emotional competencies regarding the variety of the emotional world of the human mind. It focuses on the importance of understanding and accepting the emotions of oneself and others, expressing and sharing of emotions, coping with negative emotions and stress.

The topic of intelligence deals with learning and obtaining different kinds of skills. It highlights the attitudes and mindsets that are essential for successful learning.

The topic of hobbies expands the importance of leisure time as time devoted to enjoyable activities. Hobbies provide incredible possibilities to fulfill oneself, to achieve mastery, to broaden the social network and find new friends, not to mention having fun and relaxing.

The topic of friendship considers social relationships. It includes making friends, cooperating with others, providing support to others.

Each player has her/his personal sheet of progress where the collected cards are placed. The sheet shows what cards are to be collected and helps players to arrange their cards in order. The player that fills up the whole sheet first is the winner. The gameplay is rich in player interaction, as players can exchange or donate their cards and are encouraged to do so. Players get their personal/resource cards from the deck by turns, except for the friendship cards that can be earned solely by donating cards of other types to other players.

Variability and uncertainty are added with the help of event cards that are intended to represent various life situations – the positive and the negative ones. The events can bring the additional personal/resource cards to the players, take them away or pass them to the other players. The events also include questions to bring situations up to discussion or/and reflexion.

## 5.2 Resource management game prototyping and testing

When the general concept of the game was created it was necessary to design the core structure, the game mechanics, to work out the number of game elements and their interrelation. Creating crude paper prototypes and testing them straight away was found as the most appropriate method of designing the game mechanics as it allowed detection of flaws at an early stage.

Early prototypes were made of used one-side printed paper. I did not pay much attention to the visual appearance of the cards. The symbols referring to each type of the cards were chosen almost spontaneously according to my personal associations and doodled quickly on the cards. The heart stood for health, the smiley for emotions, the eyeglasses for intelligence. Hobbies were signified by a Cyrillic letter "X", which corresponds to the Latin "H" and a number from 1 to 3, as there were three different types of hobbies. Friendship was represented as overreaching hands. The events were as well depicted by simple intuitive pictures. The rapidly created, sketchy outlook of cards later gave inspiration for the finalized design. At an early stage the narrative content, the description of situations and questions was not designed at all because it was important to create a working frame first, a "skeleton" that later would grow "flesh" on it. (Picture 3.)



Picture 3. Crude prototype of resource management game.

First, it was necessary to decide for how many players the game would be designed. I assumed that five players would make a perfect playing situation, taking into account that the game in the first instance is intended for use in institutions working with

children. Therefore, it is more comfortable to divide children into medium-sized groups. Smaller groups are less practical because in this case the number of groups increases, and it would be more difficult for the staff members to play the role of game masters observing, helping, and instructing the players. More groups would need more staff members to participate. Besides that, medium-sized groups provide better social skills training, as they allow a greater variety of social interaction within the group. From the other side, if too many players are participating, the gameplay becomes too protracted and the players can get bored while they are waiting for their turns.

After I estimated the number of players, I designed the progress sheet and decided upon the number of cards to be collected. The progress sheet was designed as an A4 paper divided into 16 slots depicting the symbols of main topics. Players are supposed to place their personal/resource cards to the slots according to the topic. Player has to collect 3 health cards, 3 emotion cards, 3 hobby cards, 3 intelligence cards and 4 friendship cards. According to these numbers I estimated the whole number of personal/resource cards needed for the game. The number of cards had to be enough for each of the players because it would encourage trading and donating the cards. If there was a scarcity of resources, the players would more likely try to keep the cards to themselves. Consequently, the number of health, emotions and intelligence cards was defined as 16 cards of each type (5 players X 3 cards + 1 extra card). Hobby cards were counted differently because they are divided into 3 subgroups (Hobby-1, hobby-2, hobby-3), and players have the choice to decide what kind of hobby they want to collect; therefore the demanded number is 6 hobby cards of each type to provide the freedom of choice. It makes altogether 18 hobby cards.

The starting point for designing the event cards was that the intention to increase variability and to give the gameplay an unpredictable twist. The events would symbolize life with its gain and losses. First, I estimated that the number of positive and negative events had to be equal or approximately equal. It was planned that the negative events would happen often through the gameplay, but yet not too often to break the optimistic atmosphere of the game. The list of negative consisting of 18 items was created. I estimated that each event has to encounter at least twice during gameplay. That makes a total of 36 negative event cards. After that, I came up with 5 types of positive event cards: 13+13+6+2+2, which makes the equal number of 36 positive cards. The number of friendship cards had to match the number

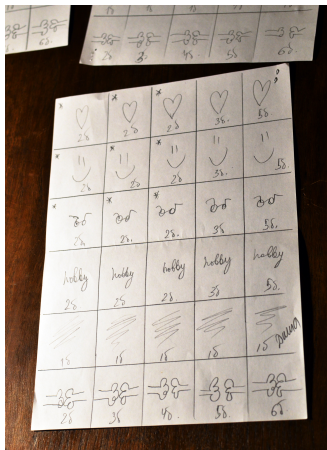
of friendship slots precisely. Friendship cards cannot be traded or donated and their number does not affect the gameplay. The only requirement is that there should be enough friendship cards for all the players.

The game mechanics were tested 5 times with the help of crude prototypes. My friends, my husband and me were the first testers because at the early stage of game development it was not necessary to playtest with the representatives of the target group. Each playtest was performed by two people, but we pretended to play on behalf of a bigger number of people: it was not critical for testing. First, the game was tested for 5 players. The playtests showed good results: the game mechanics worked and the number of cards was appropriate to create a smooth playing experience. After that, the game was tested with a different number of players. No doubt that a good board game has to be flexible and to allow varying the number of players. The number of personal/resource cards was reduced and increased consequently to 4 and 6 players. The number of event cards was left unchanged. The playtests showed that the game worked efficiently for 4 and 6 players as well.

In one of the playtesting sessions I got feedback from a friend, Ekaterina Panina, who works as a psychologist. While in general she found the idea of the game interesting and perspective, she made a point that the game did not reflect the idea of freedom of choice to set one's priorities in life. It was predefined by the game what cards exactly they were going to collect. In her opinion, it was important to give players the possibilities to make their own preferences. For example, a person could decide if she/he wants to take a new hobby or to put extra efforts to the studies. Besides that, there can be situations when different spheres of life are in conflict with each other. For example, certain hobbies can have a negative effect on health. It is necessary that a person is aware of the consequences of one's choice and understands responsibility for one's life and is ready to make choices consciously and intelligently. (Panina 2015.) I decided to think of the ways how the game can be improved to reflect the idea of freedom of choice in a more distinct way.

For this purpose I added more personal/resource cards and more slots into the progress sheet. In the second version of the game there were 4 rows of topic slots allotted for certain types of personal/resource cards and 1 extra slot for miscellaneous cards. Each

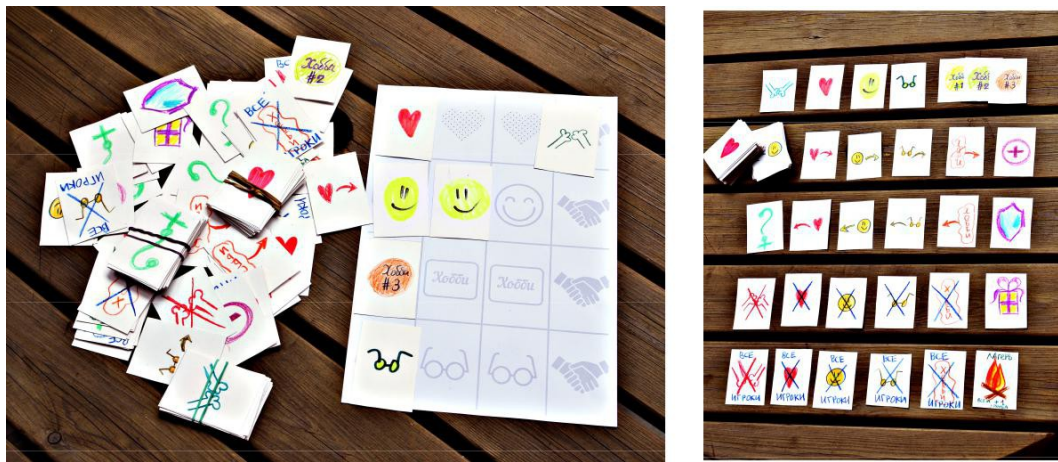
row consisted of 5 slots. The victory condition was changed: the collected cards were assigned with a certain score number, and the player who got the biggest score became the winner. Anyhow, I wanted to keep the idea of balance between the spheres of life. Therefore, I set a compulsory minimum of 3 cards of each topic to be collected. The score value of the cards depended on the number of collected cards. Thus, the first 3 cards of one type would bring the player 2 points each. After the third card the score increased. The fourth card in a row would bring 3 points to the player, and the fifth card was valued at 5 points. The score for friendship cards increased gradually with each card, namely player got 2 points for the first friendship card, 3 for the next friendship card, 4 for the next one and so on. If the player had extra cards that did not fit into the topic slots, she/he could still get points by placing cards into the miscellaneous row and getting 1 point per card.



Pictures 4 & 5. Crude prototypes of the second resource game management version.

A crude prototype of the second version of the game was created (Pictures 4, 5) and tested. The game mechanics worked, but the general result was disappointing. Firstly, the rich interaction between players was lost, as players tended to keep cards to themselves instead of trading or donating them. Secondly, the system of scoring was too complicated and forced players to concentrate more on calculating, which takes away from the social interaction between players and the relaxed atmosphere of gameplay. To sum up, the second version of resource management game did not correspond to the initial concept. I realized that all the good ideas cannot be squeezed into one solution. For that reason it was necessary to focus on the starting point of the game and to give the priority to the initial ideas, though the freedom of choice is without any doubt an important topic for children.

As the second version was found less successful than the first one, it was decided to take the first version of the resource management game towards further development. The more detailed prototype was created, and the game was taken to further playtesting (Pictures 6 & 7). The cards for the second prototype were made of thick paper. The pictures on the cards were hand-drawn with colored pencils. The back of the cards were left white. The progress sheets were printed on A4 paper. The rules were formulated and printed on A4 paper.



Pictures 6 & 7. The second prototype of the first resource management game version.

Unlike the first crude prototype, the second prototype included the list of questions for the players. Questions were asked when the player got a Plus Question card, meaning that player can have an additional personal/resource card on condition that she/he answers the question. The questions were designed to bring the topics to the discussion. The questions help children get to know themselves and each other better. It is also a practical observation tool for the specialist who works with children. Questions are dealing with the main topics of the game: health, emotions, intelligence, hobbies and friendship. (Appendix 7.)

### 5.2.1 Playtesting session №1

As Fullerton (2008, 3) notes, "a game like a party, is an interactive experience that is only fully realized after your guests arrive." Testing the game with the representatives of the target group is an indispensable part of game design process. A good design goes through a repeated cycle of testing and improvements.



The first playtesting session took place in Joensuu 22.03.2016. It was conducted with a group of children representing the target group. 6 children took part in the session: 3 girls (10, 9, 9 years old) and 3 boys (9,10,12 years old). The children belong to families of Russian nationality living in Joensuu. The session was conducted in Russian. Therefore, all the materials, including questions and rules of the game were prepared in Russian. The playtesting session was organized in cooperation with Suvenlahti, center of supplementary education and leisure activities for Russian-speaking children in Joensuu. The session was captured on video for my personal use within the project. My husband Oleg Tikhomirov played the role of assistant and cameraman. The session consisted of 4 parts: introduction, gameplay, debriefing and feedback.

In the introduction part I presented myself and the assistant and got acquainted with children. I informed children about the purpose of the meeting and gave notice about video taping. After that, the rules were explained and the gameplay begun.

During the gameplay I performed duties of game master or facilitator, giving instructions when necessary, keeping track on the turns, ensuring that the rules are followed and no confusions or cheating happens and reading the tasks aloud in the case when players got a question card and had to answer the question. The role of a facilitator is important in the game, especially when the children are getting familiar with it for the first time and do not remember the rules yet or can be easily confused. From the point of view of a game designer I was observing how the game worked and what kind of experiences players had. For the game evaluation I have defined the following criteria to be met:

- The game is engaging and emotionally appealing
- The game mechanics work flawlessly
- The rules are comprehensible
- The game difficulty level is adequate
- The game provides the freedom of choice and self-expression
- The game is educationally valuable
- The educational objectives are fulfilled
- The game brings up the topics of well-being and social skills clearly
- The game encourages to learn, arouses interest to the topic

From my observation of gameplay I got the evidence that children were engaged with the game and enjoyed playing. They looked excited and enthusiastic from the beginning up to the end, except for one of the boys, who seemed to be less excited than the others. I will discuss this more while analyzing the children's feedback. Nevertheless, the general atmosphere of the meeting can be described as high-spirited, open and fun.

The game mechanics were proved to work efficiently. The number of cards of different types was in balance. The turns were dynamic – not too long to make players feel bored while they were waiting for their turn. The consequence of actions was clear to the players. The game provided a necessary level of uncertainty and surprise, but at the same time, the result did not depend on the matter of chance only. An important role is assigned to influence the result of the game by making choices and using different tactics.

The rules and the logic of the game, in general, were comprehended to a sufficient level. Children quickly got the idea and the gameplay went fluently, though I had to constantly keep an eye on the game and to interfere if an error was going to happen. There was confusion and misunderstanding, but it did not get to the point that could spoil the whole experience.

Interpreting the event cards has shown some difficulties. Specifically, the confusion happened with 2 types of even cards: 1) when all the players lose one of their cards 2) when only the active player loses one of her cards. Misunderstanding or carelessness caused such errors as 1) trying to give away all of the cards of certain type instead of only one – for example, giving away all the emotion cards, while it is required to hand over only one of them 2) all the players are going to give away their cards while it is required only from the active player. The situation could be improved by adding small text to all of the event cards with clear instructions for the player in addition to the picture that symbolizes the action.

Another problematic zone was dealing with "beaten"/used up cards. Players had to remember to put event cards away, not returning them to the event deck, while personal/resource cards were to be shuffled back into the personal/resource cards deck because the number of personal cards is limited, and they have to be returned to the

game to prevent the blind-alley situation. As for the friendship cards, they are also placed into a different deck and returned to their own deck when lost by players, but there is no need to shuffle them, as they are all the same. Three different ways of handling the used cards and the necessity to keep the cards in three different decks without mixing them up make the possibility of mess extremely high. During the playtesting session I had to keep a vigilant eye on where the given away cards go to prevent the chaos. One of the ways to solve the problem at least partially would be to put three different colors/patterns to the backs of the cards. The prototype cards used for the playtest had white backs, which was a substantially weak point of the prototype.

Donating cards to other participants and earning friendship cards in exchange was a bright accent in the game. Through observation I noticed that children got the idea that making friends is an important part of the game. Players understood clearly the underlying idea and took it enthusiastically. For example, one of the boys decided to collect the friendship cards first of all because he wanted “to become a superfriend.” Thus, the educational objective of training social skills was implemented. Unfortunately, other educational material from the game was not presented intelligibly enough and was not apprehended by the players.

Another curious finding from the observation was dealing with different playing styles and strategies. It turned out that boys and girls adopted different strategies while playing. The boys decided to consolidate against girls, calling themselves a “clan” and taking up the cooperation strategy, meaning that their goal was to lead one of the boys to victory, no matter who exactly would be the winner. Their cooperation strategy proved its effectiveness, as one of the boys actually won. At the end of the game there was a situation when the potential winner had to collect the last card and he got it from another boy as a gift. The members of the “clan” were happy that their strategy worked out, even though only one of them was literally the winner. The boys enjoyed the cooperation itself and its result. Two of the boys wrote in their feedback forms that they especially liked: 1) friendship and ”clan” 2) smileys and ”clan” (Appendix 9.)

Girls, on the contrary, were each playing on her own behalf, although they grasped the idea of exchange as well as boys and used it – sometimes more, sometimes less effectively. For some reason, the boys' strategy was perceived by the girls as cheating,

though they did not literally break the rules. Two of the girls in their feedback forms for the question “What did you not like in the game?” answered that they did not like that boys were cheating.

The fact that players had a chance to choose different strategies proves that the game provided the freedom of making choices and setting up goals, which is one of the essential features of a good game design. I am sure that if the players were told straightly by the rules or by the game master that they can decide if they want to play on their own behalf or to cooperate, it would not be so attractive and tempting as when they do it on their own initiative. People of all ages do enjoy to express their freedom and make their own choices, not to obey to someone's preaching, even if they are worth obeying. In this case, the playing behavior was not fully dictated by rules, so players had a chance to take initiative and express their freedom.

When the game was finished we had a short debriefing stage. The purpose of the debrief is to give children the possibility of reflexion, expressing emotions and thoughts that might arise while playing and to discuss the game in perspective of learning. In this stage children expressed positive feelings from the game and claimed that they learned to be friends. No other learning results were named.

After the discussion I distributed paper forms for collecting feedback. Feedback forms were designed taking into account the age of participants, making giving the feedback easy and quick for them (Appendix 8). The questions chosen for the feedback form aimed at evaluating the player experience. Feedback form consisted of 13 questions including 2 questions on personal data (name, age), 7 questions with given answer options, 4 open-ended question about the gameplay.

The most illustrative question from the feedback form proposed the players to describe their mood by choosing one or several of six given emoticon-pictures. According to the given feedback, all the players were in high spirits while playing – all of them chose pictures with happy and excited faces. All of the respondents answered that it was interesting to play. Five out of six respondents answered that they would like to play again, while the sixth boy answered that he was not sure if he wanted to play again. It was that boy who seemed less excited than the others. There can be several explanations

why he seemingly enjoyed less than the others. First of all it can be assumed that the boy felt less comfortable in the company because he was a newbie. He had not met the other children before while the others knew each other well. Secondly, the boy's behavior can be affected by his personal traits of character, such as shyness. And thirdly, being 12 years old, the boy belongs to the boundary age within the target group (7-12 years), which can be interpreted in two ways. Either it was a bit boring for the boy to play with smaller children, or the game itself is suited better for smaller children. Further tests in different age subgroups are needed to clarify the situation as it is not possible to make relevant conclusions due to lack of experiential data.

The target group boundaries are rather wide, meaning that there are significant differences in the development of children from the lower and the upper age boundaries. To get the objective picture it is necessary to test the game in groups narrowed by age as well as in mixed age groups to see how this would affect the gameplay and player experience. If it turned out that the game is not suitable for the lower or upper age boundaries, there would be 2 possible decisions: to narrow down the age boundaries or to make the game more flexible to match with the current target group boundaries. Further diversified testing can be seen as the future development possibility, but it was not implemented within this thesis work due to time restrictions and lack of partners that could cooperate in the matter of organising test sessions with larger number of players of different ages.

The game difficulty level, according to the feedback results as well as according to the observation, was suitable. The game was challenging enough to be fun, but not too difficult to bring frustration and irritation. The feedback form included a question how difficult the game was with 3 possible options: a) too easy b) too difficult c) suitable. All of the respondents have chosen the "c" variant. As for the rules, all the participants claimed them to be clear, not confusing.

It was difficult for the players to define if they learned something through playing. The question №4 asked if they learned anything with the following answer options: a) yes b) no c) I don't know. 3 of the respondents answered "yes", 1 - "I don't know", 1 - "no" and 1 - "yes" and "I don't know" simultaneously. For the open-ended question №9 "Did you learn something new? What?" there was only one answer "To be honest!", while the others left the answer box empty or wrote: "I don't know."

Another question that was difficult to answer was the last one: “Do you have any ideas or wishes considering the game?”. There was only one substantial answer for that: “More pictures!”. It is not a surprise that open-ended questions were left without answers in many cases because they require more concentration and efforts from the respondent. In general, people are less willing to answer the open-ended questions in feedback forms, that is why I added as much questions with answer option as possible to get more clear and structured feedback.

To sum up, a lot of valuable information was collected during the playtesting session for further improvements. The data got from observation, debriefing and feedback forms is found to be coinciding, noncontradictory. The data can be arranged into the following checklist (Table 1).

Table 1. Game evaluation checklist.

The game is engaging and emotionally appealing	Yes
The game mechanics work flawlessly	Almost
The rules are comprehensible	Yes
The game difficulty level is adequate	Yes
The game provides the freedom of choice and self-expression	Yes
The game is educationally valuable:	Partly
- The educational objectives are fulfilled	Partly
- The game brings up the topics of well-being and social skills clearly	Partly
- The game encourages to learn, arouses interest to the topic	Yes

The main problem detected through the playtesting sessions was the educational inefficiency of the game. To put another way, the game was fun, but it did not teach as many good things, as it was supposed to do. The largest part of the game, educational objectives, was not fulfilled. At this point it was partly expected because it was planned that I would add more narrative, educational content after the testing. The main purposes of the testing were to check the game mechanics and to assure that the game was enjoyable for the players. Then the narrative content was to be added in the form of a brief description of different life situations dealing with health, intelligence, hobbies, friendship and emotions. The playtest proved one more time that the abstractions are

not easily perceived by children of the target group age. The players obviously did not realize that the cards symbolized important things in their lives. They did not think of it in this respect. The explanation or some educational discussion could be added at the beginning of the game, but from my point of view, it would not have a very high educational value because it would be perceived by children as something boring, something unrelated to the game and to having fun. On the contrary, when a child has a possibility to discover something by herself through an engaging activity, the discovery will imprint brightly in the child's mind, it would be appreciated as something personal, own precious experience and own conclusion. That is why it is important to add the educational content in a way that it would be an inherent part of the game.

### **5.2.2 Playtesting session № 2**

Playtesting session №2 took place in Petrozavodsk on 24.03.2016. It was a part of a wider design workshop that I organized for Darya Berezina and Natalya Nikulina, specialists from the partner organization "Planik". In addition to playtesting, the workshop included project presentation and ideation of the visual world of the game. Although the participants, being adults, did not belong to the target group, the session was of high importance for the project because of the great possibility to acquire professional, relevant feedback from the experts working with children and creating educational products for children. I participated in the playtest as the third player because the game was designed to be played at least by three people. The session was captured on video for my personal use within the project. The feedback on the game features was collected simultaneously while playing. The main things were put down on paper notes straight away, and then further revising was made with the help of the video.

Unlike the first playtesting session, this time I was planning to test how understandable the rules would be for adults without extra explanations. It is crucial for the usability of the game, as the user manual has to contain exhaustive information on the game in an understandable form for the adults, who would play the role of the game masters/facilitators. That is why I prepared the written manual containing all necessary information to play the game.

The specialists from “Planik” showed high interest in the game development project. The game concept was found promising and important. According to Darya and Natalya, there is a need of psychological educational games for children, especially the games that train emotional and social skills: teach to express feelings and allow to walk through various social situations.

The game mechanics were found to work efficiently, as well as in the first playtesting session. The number of cards was adapted to the number of players: redundant cards were put away. The gameplay was fluent and the amount of confusion was acceptably low.

As well as in the first playtesting session the same problem with the “beaten” cards was detected. One of the players suggested that the players actions considering cards should be uniformed, because it is confusing that the event cards are put aside while the personal/resource cards are returned back to the deck and the deck is then reshuffled. It was proposed that both types of cards would be put aside. When the personal/resource cards deck would run out of cards, the used up cards would be shuffled and used again. This measure would reduce the amount of actions to remember, therefore, reduce the confusion and frustration.

Understanding the manual was non-problematic, though I must admit that being present there and participating in the game, I could not stop myself from giving comments and explanations. Nevertheless, my comments were not the main factor for understanding the rules, they only made the process faster. The players agreed that manual was clear for them and contained the necessary information. At the same time, Natalya added that there are people who are not very comfortable with reading manuals and understanding the rules of tabletop games. She suggested an idea of creating a video instruction for such people.

As it was already expected after the first playtesting sessions, the experts remarked that there was a certain need of adding more narrative content that would describe social situations. Darya pointed out that symbols were currently perceived as mere pictures. The player was not aware of the content lying behind the symbols, but collected the cards mechanically. It was suggested to put a social situation, a short story, to each of the cards. I found the idea suitable, but noted that the stories might be perceived as



extrinsic, alienated content, because players do not necessarily need to read the stories to progress in the game. Darya and Natalya agreed with my anticipations. As a solution, Darya suggested to remove the symbols from personal cards and put only the situations there. As a result, reading and understanding of the situation would become a critical condition, because the player will have to define by herself to which row the card should go. On the other hand, it might be too difficult for children. Therefore, it was suggested to add color differentiation of card types. I found that idea viable and decided to use it in the improved version of the game.

The experts found the choice of personal card topics appropriate, but the representation of emotions was criticized. Using a smiley as a symbol of emotions gives the wrong image of what emotional life really is, as the spectrum of emotions is various and it would be wrong and impossible for a person to feel only positive emotions. In the process of emotional maturation children learn to cope with a wide range of emotions. To cope emotionally one has, first of all, to accept the emotions and to accept the fact that as human beings we experience all kinds of emotions including negative ones. It is necessary to give oneself the right to be angry or sad and to be able to express the negative emotions as well as the positive ones. I fully agreed with the critics. In the improved version of the game I added various social situations on the topic of emotions, describing joy, pride, affection, anger, sadness, fear, shame. As for the icon depicting emotions, two characters were finally used – a happy one and a sad one, symbolizing both positive and negative emotions.

### **5.3 Narrative elements**

Though narrative elements were the last elements to be designed, they are the essential part of the game design because they bear the educational message predominantly. They have the purpose of illustration and provide food for thoughts. They make players go through different life situations and correlate them with their own life situations that might be similar.

The narrative elements are short stories from a life of a usual child of 7-12 years old. The stories are placed on personal/resource cards and event cards. The stories expand the announced topics of health, emotions, friendship, intelligence and hobbies. They give positive examples that can be implied by children in their own lives, yet they do not have the didactic tone, do not give any straight instructions or advice that children hate so often. The stories have the form of I-messages to strengthen the identification of player with the situation. The personal/resource cards contain also negative situations. A negative situation often includes a positive feature, a possibility or the way how the problem was solved or can be solved. For example: “I was afraid of dogs before, but then I met a very friendly and merry dog and I am not afraid anymore.”

#### **5.4 Finalizing the design**

When the game mechanics were tested and the narrative elements were designed the finalizing stage started. For that purpose, I conducted a co-creative workshop and created a moodboard as an ideation tool. The creative workshop took place in Petrozavodsk in cooperation with Planik. Darya Berezina and Natalya Nikulina were participating in the workshop together with myself. The purpose of the workshop was to form a basis for developing symbols for the cards, representing health, emotions, intellect, friendship. A range of inspirational pictures was offered for discussion. The pictures were placed in order of suitability as symbols. The pictures were provided with comments on sticky papers (Pictures 8,9,10). The pictures that were chosen as the most suitable were used to create a moodboard (Appendix 10)

To represent the topic of health 2 pictures were selected: children showing off biceps and a heart lifting weights. The picture with children was chosen because the association was clear and the picture was appealing. The participants noted that pictures containing characters, but not lifeless items, should be preferred, as people always tend to be attracted more by faces than by things. It was marked out that the picture with children represents both genders, which is a plus. The heart lifting weights was chosen because of the association ”healthy, strong heart – healthy person” and the analogy with video games, where lives are most often



For the topic of intelligence participants chose the pictures of children and an owl wearing a graduation hat. It was interesting to observe that eyeglasses have a strong association with intelligence, though obviously sight problems does not have any relation to a person's IQ.

For the topic of emotions the pictures of a smiling sun and jumping people were marked as suitable, but it was noted that jumping people are also associated with health, thus, use it as a symbol might be confusing. It was also discussed that emotions are not only positive.

After the inspirational visual material was collected and organized in a moodboard, I proceeded to the graphic design part. Adobe Illustrator software was used for creating the design. The visual appearance of the game was inspired by patchwork. Patchwork kilt symbolizes the diversity of life and matches well with the game idea where players assemble their happy lives of various pieces. The patchwork motive is expressed the most distinctly in card back design. Two types of backs differentiate event and resource cards (Picture 11).



Picture 11. Card back design.

Each topic was assigned with a color and symbol. Health got green color and a heart character as a symbol. As the heart symbol was disputable I conducted a rapid survey on the Internet asking people to give their associations. 17 people took part in the survey. 4 answers considered love associations, 6 – strength, 6 – health, 1 – happiness and 1 - positiveness. Thus, it was decided to keep the heart symbol, as the associations with love were rarer than the expected associations with health. The character was designed with a smiling face taking into account the fact mentioned above: people are more attracted to the images of faces.

Emotions got yellow color and a symbol of a smiling sun and a crying cloud corresponding to positive and negative emotions. Intelligence was designed in violet color and got a smiley-like character wearing a graduation hat. Friendship was assigned with red background colour and the image of shaking or holding hands. Hobby cards have an orange background and three symbols depicting three choices of hobbies – art, sports, and music. Players can decide which hobbies they are going to collect. All the resource cards contain a picture in a circle and a text – a short statement or story. When I was designing the visual appearance of the cards, I realized that some changes have to be made to the initially prepared narrative material. Part of the texts had to be shortened so that a picture would fit. Part of the pictures are illustrating the stories, part of the cards contain the main symbol instead of an illustration to support the keynote of the game. (Picture 12.)



Picture 12. Resource cards.

The event cards are designed similarly to the resource cards. The same colors are used. All the event cards contain a picture in a circle that visualizes the event. For example, if there's a crossed heart on the event card, the player is supposed to give one of her/his health cards away. There is also a text hint, which is practical for new players because they would not need to peek into the manual every time to check the meaning of the card. Plus Question cards contain also the questions that have to be answered by the players. I decided to give up the idea of placing the narratives to the event cards so that not to make the design too overloaded with text. (Picture 13.)



Picture 13. Event cards.

Progress sheet was designed as A4 paper with 16 slots for collecting resource cards and friendship cards. Players place resource cards to the slots being guided by matching the colours of the slots and the cards and matching the content of the cards with the corresponding symbols. (Picture 14.)

Finally, the prototype of the game was created: the cards and the boards were printed, laminated and cut. The same technological process is used by Planik. Lamination is recommended because it allows making the cards very durable. Glossy laminating film was used for the current prototype, but I would prefer to use matt one in further production. (Picture 15.)



Picture 14. Progress sheet.



Picture 15. Finalized prototype.

After the prototype was ready, I noticed some issues that can be considered further. First of all, the white text is not visible enough against the yellow background color. Secondly, the progress sheet may be designed in muted colors so that the progress would be literally visible. When it is as bright as the cards, the collected cards are melting into the progress sheet, which is a significant flaw. The players have to be aware of the situation not only with their own progress, but also with the progress of other players, which is a necessary condition for trading. I am going to make the corrections to the following prototype in the Russian language that will be used for further playtesting in Russia.

## **6 CONCLUSION**

As a result of the design process described in the thesis report, we have finalized to a certain point, but not yet the final prototype of an educational board game for children. At the moment of submitting the report the game development is still in progress. The following actions will include further playtesting. I am going to design a package as well. Although the final evaluation of the product can not yet be made, the results of in between evaluation are satisfying.

I am planning to continue cooperation with Suvenlahti and to search for more partners and playtesters, as testing is crucial for creating a player-centered design of a game. The cooperation with Planik will continue as well. We are discussing the possibilities of the game production and distribution as soon as the product development will be finished. In the nearest future I am interested in searching for ways of bringing the game to the user.

The thesis project was of high educational value for my competence. Game design was a totally new field for me as a designer. I explored it deeply through theory and practice. The project involved learning by doing to a great extent: learning through experiment and tryouts. One of the biggest advantages of the project was the fruitful cooperation with Suvenlahti and Planik.



Thanks to this project, I have mastered the skills of research, game design, graphic design, and communication. My interest in design and education has grown stronger and I am looking forward to further development in both fields.

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## **Charge your Batteries**

The content of cards and their point values

- To have a nap – 2 points
- To dance – 2 points
- To take a walk – 2 points
- To play active games with friends outdoors – 2 points
- To watch TV – 0 points
- To play on the tablet/phone/computer – 0 points
- To play with the dog outside – 2 points
- To ride a bike – 2 points
- To pet a cat – 1 point
- To read an interesting book – 1 point
- To take a shower – 1 point
- To swim in the pool – 2 points
- To help parents about the house – 1 point
- To do the room – 1 point
- To eat crisps and to drink lemonade – 0 points
- To browse the Internet – 0 points

## **Alien Kitten**

Situations and possible reactions to them. The right answer is underlined.

### ***The lost ball***

Kitten has lost his favourite toy at school – a colourful ball, which was your present. He comes to you upset. Your reaction:

- Oh, how could you be such a woolgatherer?
- That's a pity that the ball is lost. You are upset. Let's go and ask help from the teacher tomorrow, maybe we will manage to find it. But try to be more careful next time.
- I bet it is your classmates' fault!

### ***Well done!***

Kitten got an “A” for the English test. He put a lot of efforts into studies and the result was not late in arriving. Your reaction:

- Hurray! We are so glad! You have done a great work!
- You are our little genius! We always knew that you have an innate ability to learn languages.
- Well done! What about the others? What marks did they get?

### ***Setback at school***

Kitten has got a bad mark in reading course. Your reaction:

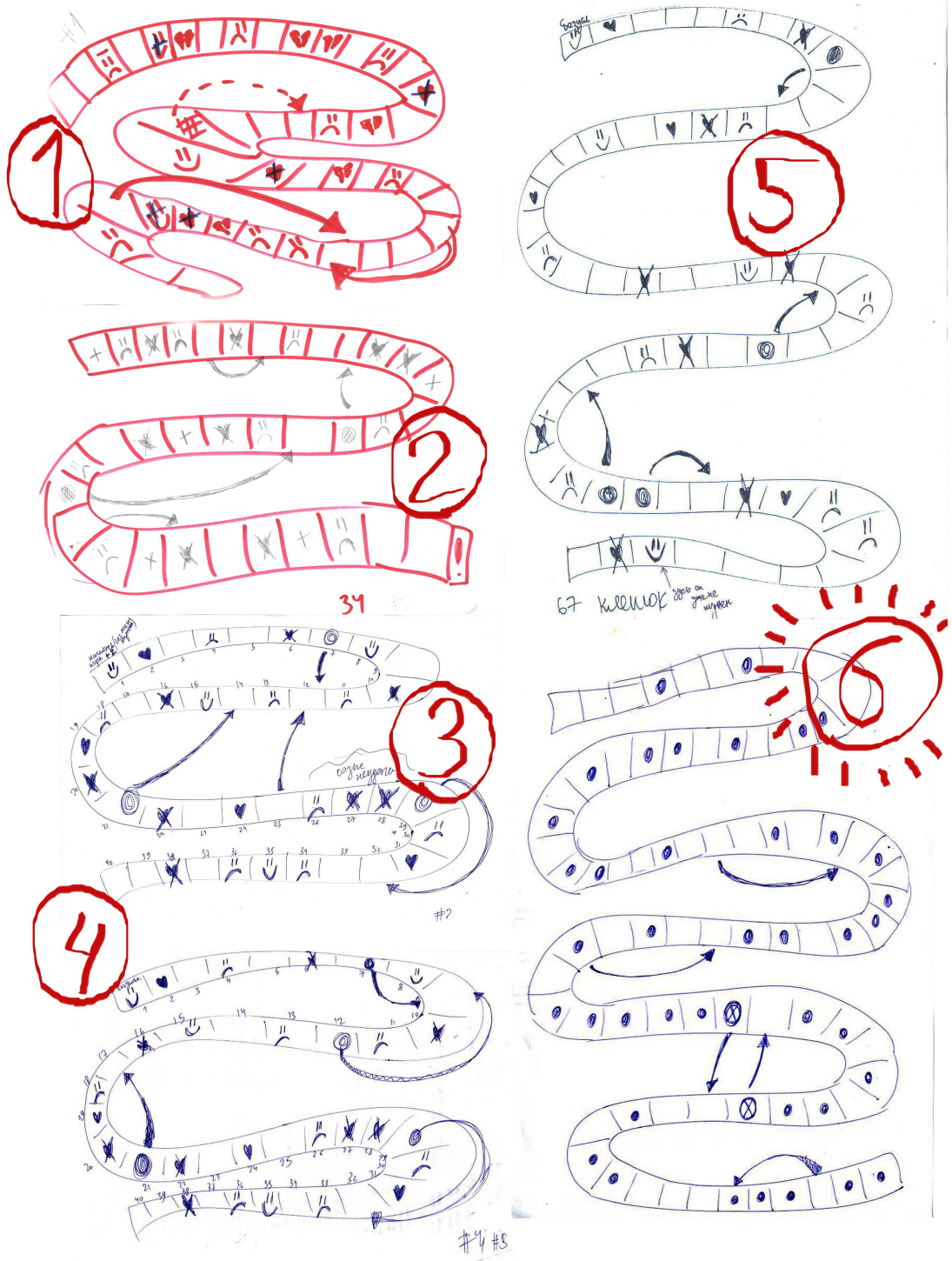
- We are so disappointed. What a shame!
- That's a pity that you haven't managed this time. Let's think why it could happen. Maybe you didn't dedicate enough time to homework?
- It's awful! Even Snowball got a better mark than you!

***Second place***

Kitten was striving to win in sports competitions. He has been training for a long time and did his best to prepare. The result was good, but he got only second place. He is very upset. Your reaction:

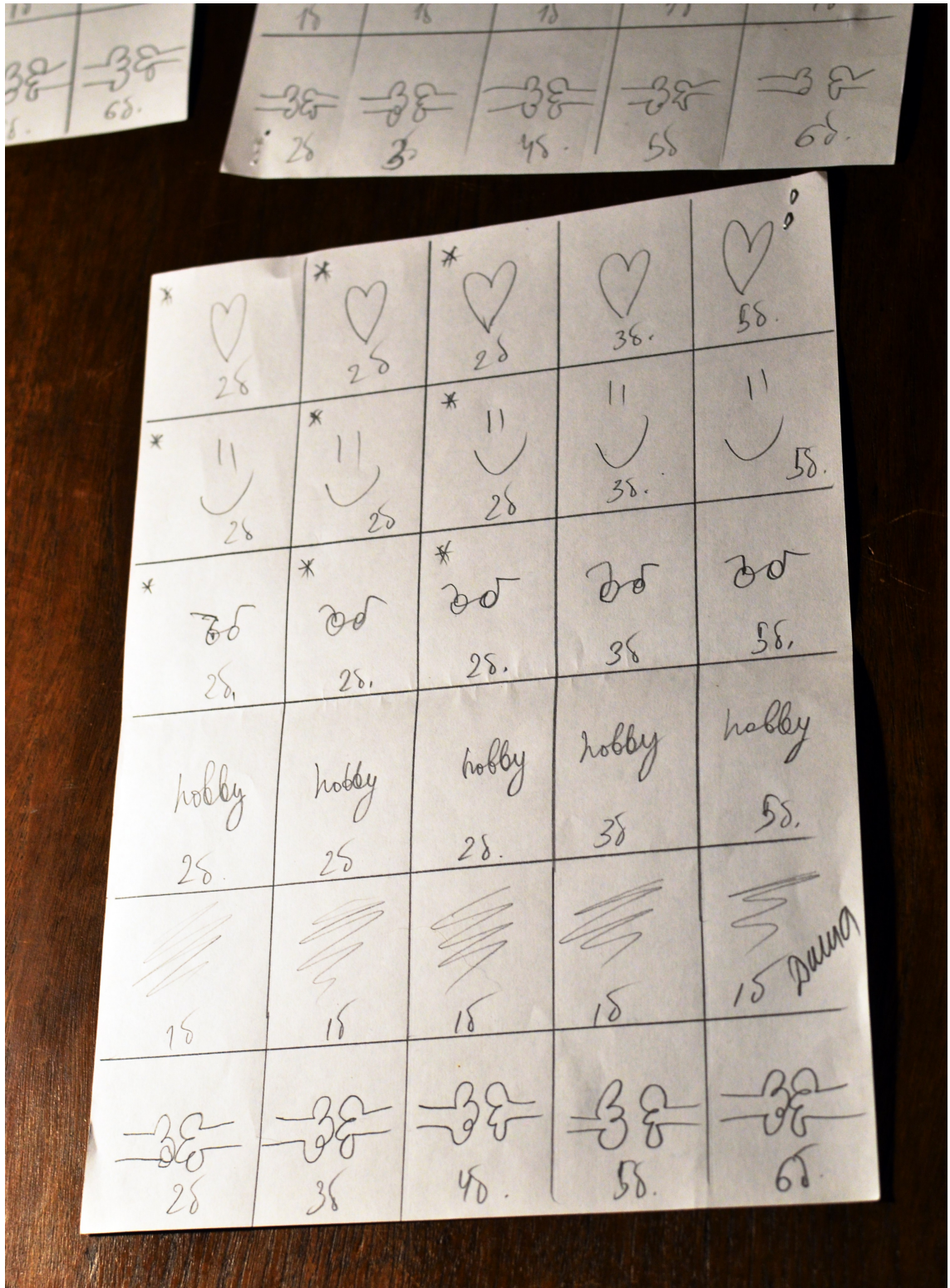
- In fact, you are the best, it was just a bad luck.
- We understand how disappointing it is for you. But you did really well! We are proud of you. You've achieved great progress.
- Oh no... you had to try better, you could win!

Evolution of race game board in crude prototypes

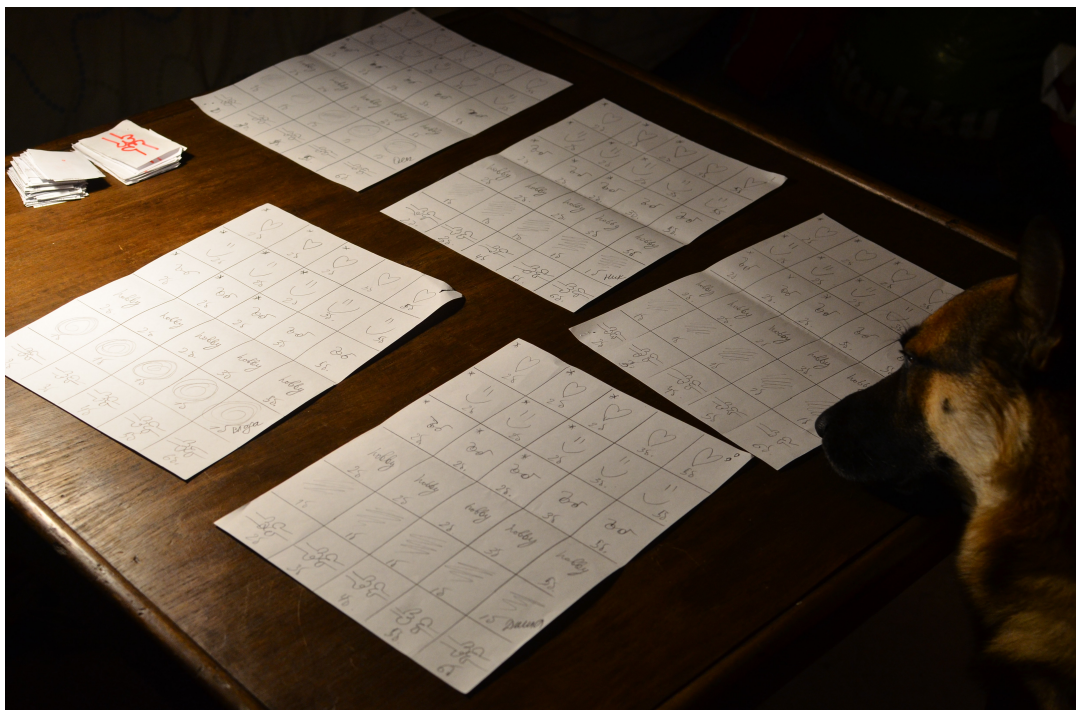




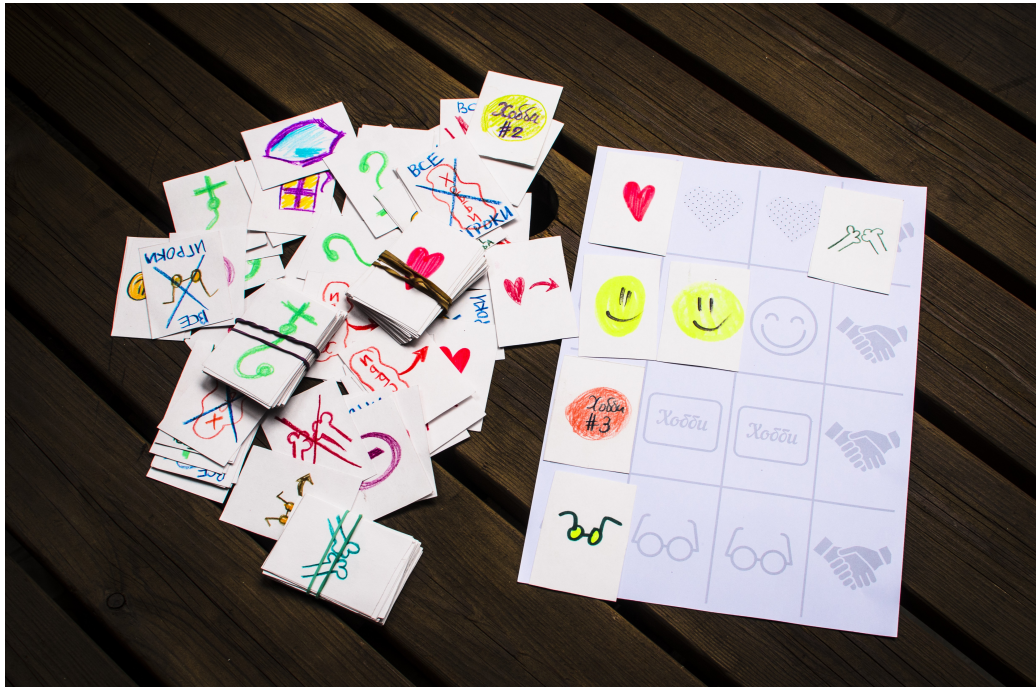
Progress sheet, crude prototype of resource management game, version 2



**Developing the resource management game: playtesting version 2 with a crude prototype**



Resource management game, version 1, prototype 2



**Resource management game, text for the cards**

HEALTH

1. I get up easily in the morning because I sleep 9-11 hours and have a good rest.
2. Every day I hang around outside with my friends.
3. I get a glass of clean, drinking water every time I have a meal.
4. I walk to school and back home.
5. When I am doing my homework, I often take a musical break –I turn my favorite music on and dance for 10-15 minutes.
6. I eat fresh fruit and vegetables every day.
7. I never forget to have a good breakfast, because I need energy for the whole day.
8. Instead of chocolate bar or crisps, I would prefer to have a banana and some nuts as a snack.
9. After a hard day at school I like to lie down for a half an hour and think about something nice.
10. I get dressed according to the weather to feel comfortable. When it is cold I don't forget a hat and mittens. If it rains I put rubber boots and a raincoat on or take an umbrella with me.
11. In summer I spend no hot day without swimming and sunbathing.
12. I like to ski on the weekends.
13. I learn to skate. It is cool! Tell the truth I still fall down often, but protective gear helps to prevent injuries.
14. In winter you can often meet me on the skating ring.
15. I brush my teeth thoroughly because I don't want to lose them at all.
16. If something hurts or bothers me, I always tell adults about that.
17. I wash my hands after the toilet or when I come home.
18. In hot weather I wear a cap or a hat. And if I take a long sunbath, I use sunscreen, otherwise, you can get burned.
19. When we choose shoes for me together with adults, I try them on and make sure that they are comfortable, don't wring or graze – I don't want to suffer later in uncomfortable shoes.

INTELLIGENCE

1. I am not afraid of making mistakes. It is ok, since you learn on your mistakes. The only man who never makes a mistake is the man who never does anything.
2. If I don't understand something, I always ask, not being afraid to look stupid. It is better to ask once, than continue to be ignorant.
3. When I am learning something new, I never compare myself to others, as it does not help me to develop my skills. It is more important to concentrate on my own progress.
4. I remember, that no result comes without efforts.
5. I know that failures do not make a loser of me, quite the opposite, they provide important experience. If I don't succeed today, I will try tomorrow again, finally it will come!
6. I am not afraid of challenges, they are exciting!
7. Talents and abilities are not the guarantee of success. You need to put effort into your work if you want to achieve success.
8. I have a library account in the city library. There are so many different wonderful books. I don't know yet how to use the catalogue, but next time I will ask the librarian to teach me.
9. I have an Internet friend from Canada. We communicate in English. I don't always understand him, but the translating program helps a lot!
10. Sometimes you need to defeat your fear or embarrassment to move forward.
11. Russian is a hard subject for me, but I don't give up – I spend more time on it and ask for help if I don't understand something. But how great is the feeling when you finally cope with a difficult task!
12. I love to meet new people. You can learn so many new things!
13. If I am facing a big, difficult issue, I break it up to smaller pieces. It is so much easier to manage with it in this way!
14. When I am working on a task, I try to concentrate only on it, I don't turn on the TV or browsing the social networks.
15. I can do more when I plan my day well.
16. I like to do usual things in a new way and find unusual solutions.
17. I am not afraid to fight my corner.
18. When disadvantages are being pointed out in my work, I don't get offended, because

it helps me to improve.

19. I enjoy hanging around with small kids. I always tell them something interesting or explain something new.

## EMOTIONS

1. I often hug my dearest and tell them that I love them.

2. When my cat was ill, I got sad and anxious. I told my friend how I was worrying, and she sympathized with me.

3. When I have a bad day, I try to remember, that it won't be always like that – it will be better!

4. How nice it is, when your family notices your success and tell you that they are proud of you.

5. I miss my granny, as she lives in another city. It is good that we can talk on Skype!

6. My little sister pissed me off, when she took my phone without permission. But I won't shout at her, as she will not understand anything, if I do so. I will try to explain her why I am angry.

7. I was afraid of dogs before, but then I met a very friendly and merry dog and I am not afraid anymore.

8. I love to laugh loud and fool around with my friends.

9. Parents arranged a great party for my birthday! It was so cool!

10. I don't hang up on the negative, I try to think more about the good stuff.

11. I share my feelings with my nearest. It is very important to have a person who can listen and sympathize.

12. I appreciate good things that I have.

13. A new boy came to our class and all the children were laughing at him because of his protruding ears. I was laughing together with others, but later I was so ashamed.

14. I am afraid of darkness, that is why I switch the night-light on, when I go to sleep, and take my teddy with me – it is not so frightening with him.

15. We slid down the hill today with my friends – it was a bit chilly, but fun!

16. Today I helped our neighbor, an old grandpa, to carry a bag with products to his apartment. He thanked me and I felt so good.

17. An older boy started to harass me in the bus, calling bad names. It was hurtful and

annoying. I moved to the front seat, closer to the driver, and the boy calmed down.

18. My big sister was teaching me to swim and finally I learned to swim! I am so happy and proud of myself!

19. I lied to my mom to get permission to go for a walk. But the walk was not fun, as I was ashamed for the lies.

## EVENTS

1. Lose health — Food poisoning. You have eaten a bad pie and your tummy is aching.
2. Lose health — Concussion of brain. You fell down from your bike and bumped your head.
3. All players lose health — Epidemic of flu. Everybody has to stay in bed with fever, runny nose, and cough.
4. All players lose health — Bad ecological situation. The contaminated air affects your health.
5. Feel down — Your good friend have moved to another town and you will seldom see each other.
6. Feel down — You have been told offensive things.
7. All players feel down — The school bus got into a road accident. Some of the children are injured. Others are safe, but frightened.
8. All players feel down — This week you are going to have 3 tests!
9. Lose intelligence - You've been playing computer games all the holidays and did nothing more.
10. Lose intelligence — You copy the home-task from your classmates all the time.
11. All the players lose intelligence — The school library is invaded by dangerous mold that spoiled all the books.
12. All the players lose intelligence — An interesting excursion was planned, but it was canceled because of the flu epidemic.
13. Lose friendship — A friend told you her/his secret, but you blabbed it to everybody.
14. Lose friendship — You and your friend could not decide which film do you want to see and quarreled about that.
15. All players lose friendship— All of you bullied a new girl together.
16. All players lose friendship — All of you were playing ball and broke the window,

so you didn't think of something better than to shift the blame on your innocent classmate.

17. Summer camp — All of you made for a summer camp and buddied up.

18. Lose a hobby— You need to buy expensive equipment for your new hobby, but you don't have enough money yet.

19. Lose a hobby — You cannot find free time for your new hobby. Maybe you have to give up some other activity to fit a new one?

20. All players lose a hobby — All of you are playing in a school theater, but your director got sick, you have to stop the rehearsals until she gets better.

21. All players lose a hobby — All of you are fond of skating, but this year the winter does not want to come and there is still no ice!

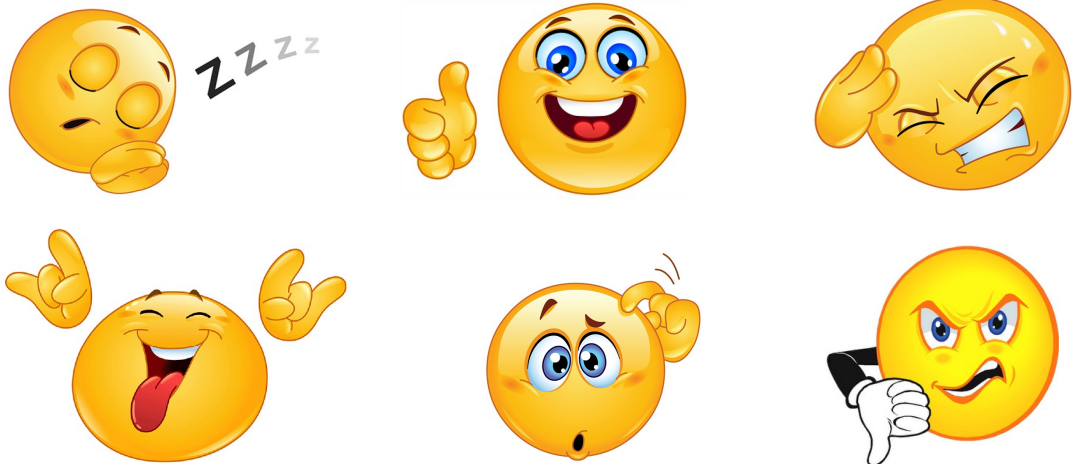


# Feedback

My name is \_\_\_\_\_.

I am \_\_\_\_\_ years old.

My mood while playing was (circle the picture):



Choose and underline the suitable answer

18. Playing was: a) interesting б) boring
19. How was the difficulty of the game? a) too easy б) too difficult в) just ok
20. Would you like to play again? a) yes б) no в) I don't know
21. Have you learned anything while playing? a) yes б) no в) I don't know
22. Questions and tasks were a) interesting б) stupid в) unclear
23. The rules were a) clear б) too complicated
24. Most of all I

liked: \_\_\_\_\_

25. I didn't like: \_\_\_\_\_



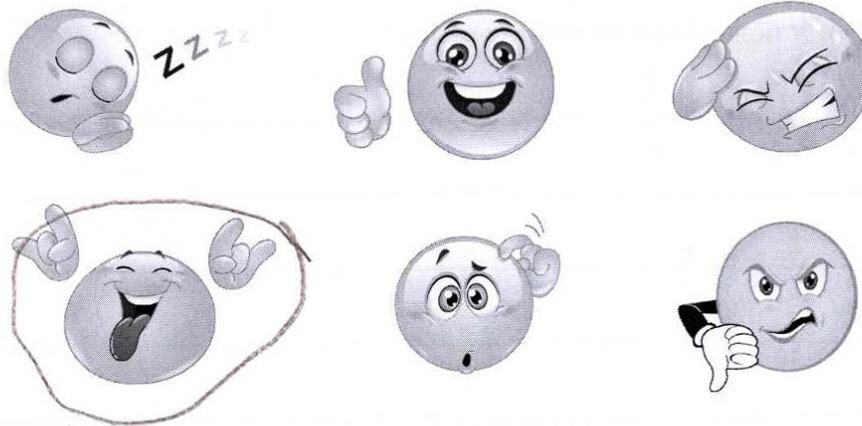
## Feedback from one of the playtesters

## Отзыв

Меня зовут Иван

Мне 9+ лет.

Мое настроение на сегодняшнем занятии (обведи картинку):



Выбери и подчеркни варианты ответа:

- 1) Играть было: а) интересно б) скучно
- 2) По сложности игра: а) слишком простая б) слишком сложная в) подходящая
- 3) Хотел(а) бы ты еще поиграть в эту игру? а) да б) нет в) не знаю
- 4) Игра чему-то тебя научила? а) да б) нет в) не знаю
- 5) Вопросы и задания в игре были а) интересные б) глупые в) непонятные
- 6) Правила игры а) понятные б) слишком запутанные

7) Больше всего мне понравилось:

смайлики («кики»)

8) Больше всего мне НЕ понравилось:

нечего

9) Научился(лась) ли ты сегодня чему-то новому? Если да, напиши, чему.

~~Н~~ ~~Х~~ ~~Н~~ ~~Е~~ ~~З~~ ~~Н~~ ~~А~~ ~~Ю~~.

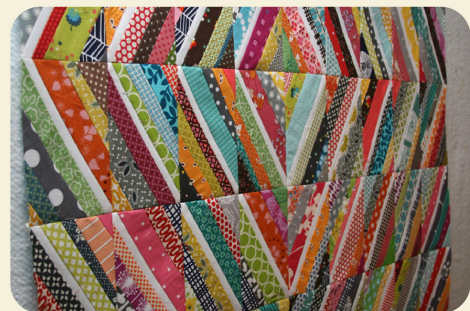
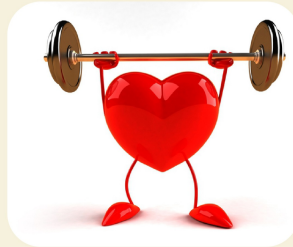
Твои идеи и пожелания по поводу игры:

Н Е Ч Е Г О !

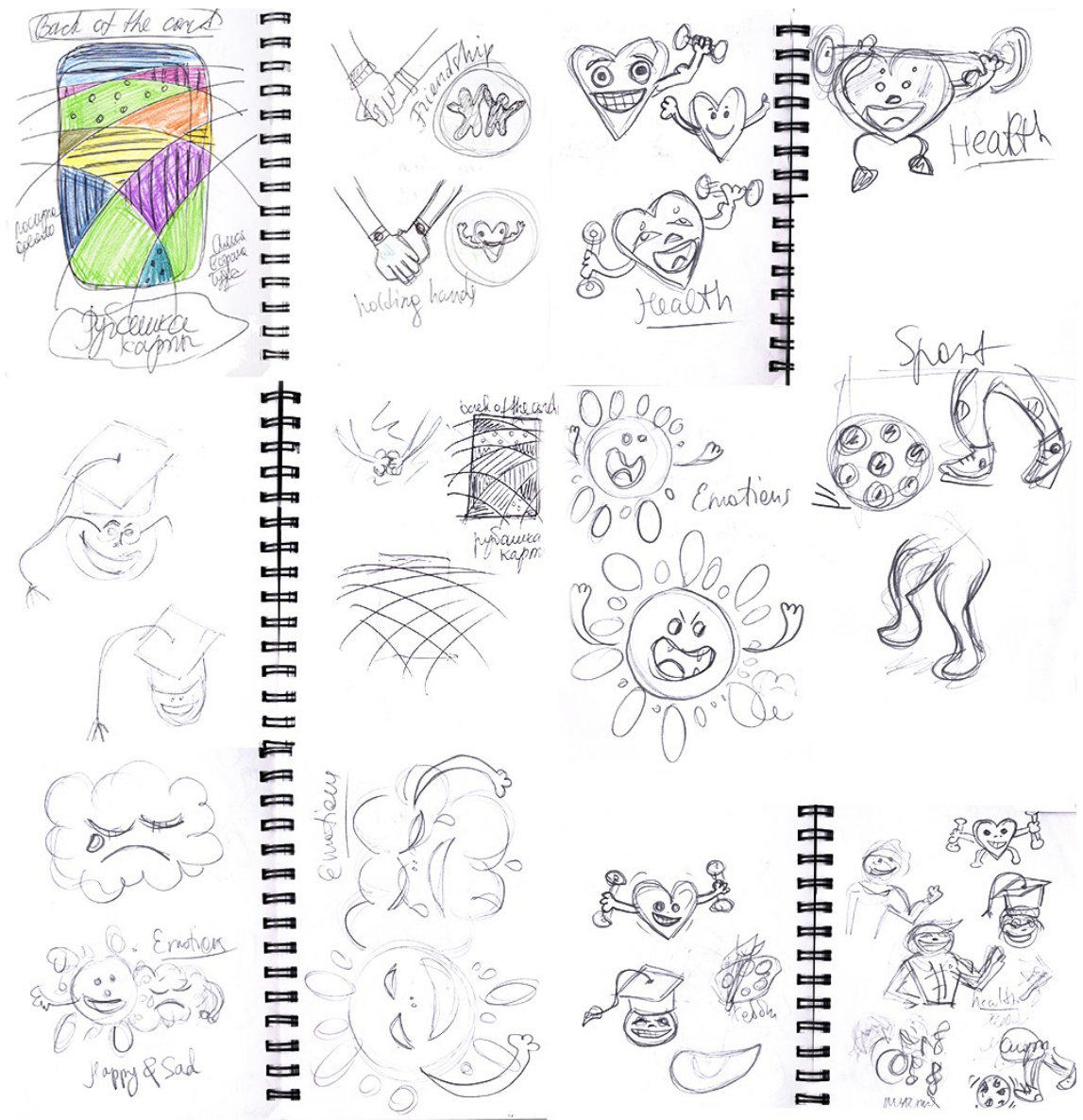
**Спасибо!**

Moodboard

# Moodboard



Various sketches



### Evolution of card design



Card designs


Resource cards

<p>I eat fresh fruit and vegetables every day.</p> 	<p>I get up easily in the morning because I sleep 9-11 hours and have a good rest.</p> 	<p>When I am doing my homework, I often take a musical break - I turn my favourite music on and dance for 10-15 minutes.</p> 	<p>I get a glass of clean, drinking water every time I have a meal.</p> 
<p>Instead of chocolate or crisps, I would prefer to have a banana and some nuts as a snack.</p> 	<p>Every day I hang around outside with my friends.</p> 	<p>I wash my hands after the toilet or when I come home</p> 	<p>In summer I spend no hot day without swimming and sunbathing.</p> 
<p>After a hard day at school I like to lie down for a half an hour and think about something nice</p> 	<p>When it is cold, I don't forget a hat and mittens. If it rains, I put rubber boots and a raincoat on or take an umbrella with me.</p> 	<p>I walk to school and back home.</p> 	<p>When it is hot, I wear a cap or a hat. And if I take a long sunbath, I use sunscreen, otherwise, you can get burned.</p> 
<p>When we choose shoes for me together with adults, I try them on and make sure that they are comfortable, don't wring or graze.</p> 	<p>If something hurts or bothers me, I always tell adults about that.</p> 	<p>I never forget to have a good breakfast because I need energy for the whole day.</p> 	<p>In winter you can meet me on the skating ring.</p> 





Card designs

Resource cards

<p>We slid down the hill today with my friends – it was a bit chilly, but fun!</p> 	<p>My big sister was teaching me to swim and finally I learned to swim! I am so happy and proud of myself!</p> 	<p>I share my feelings with my nearest. It is very important to have a person who can listen and sympathize.</p> 	<p>When I have a bad day, I try to remember, that it won't be always like that – it will be better!</p> 
<p>There was such an annoying boy in the bus! I had to move to the front seat, closer to the driver because the boy was bullying me.</p> 	<p>I lied to my mom to get permission to go for a walk. But the walk was not fun, as I was ashamed for the lies.</p> 	<p><b>Sports</b></p> 	<p><b>Art</b></p> 
<p><b>Music</b></p> 	<p>I know that failures do not make a loser of me, quite the opposite, they provide important experience.</p> 	<p>I love to meet new people. You can learn so many new things!</p> 	<p>Sometimes you need to defeat your fear or embarrassment to move forward.</p> 
<p>I have an Internet friend from Canada. I don't always understand him, but the translating program helps a lot.</p> 	<p>I like to do usual things in a new way and find unusual solutions.</p> 	<p>I am not afraid of making mistakes. It is ok, since you learn on your mistakes.</p> 	<p>If I don't understand something, I always ask not being afraid to look stupid.</p> 

Card designs

Resource and friendship cards

<p>I have a library account in the city library. There are so many different wonderful books!</p> 	<p>If I am facing a big, difficult issue, I break it up to smaller pieces. It is so much easier to manage with it in this way!</p> 	<p>I remember, that no result comes without efforts.</p> 	<p>I am not afraid of challenges, they are exciting!</p> 
<p>When disadvantages are being pointed out in my work, I don't get offended because it helps me to improve.</p> 	<p>I enjoy hanging around with small kids. I always tell them something interesting or explain something new.</p> 	<p>When I am working on a task, I try to concentrate only on it, I don't turn on the TV or browsing the social networks.</p> 	<p>When I am learning something new, I never compare myself to others, as it does not help me to develop my skills.</p> 
<p>Talents and abilities are not the guarantee of success. I know that I need to put efforts into my work to achieve success.</p> 	<p>Russian is a hard subject for me, but I don't give up - I spend more time on it and ask for help if I don't understand something.</p> 	<p>I am not afraid to fight my corner.</p> 	<p>I can do more when I plan my day well.</p> 
<p>Friendship</p> 			

Card designs

Event cards



## Card designs

### Event cards

