Ekopolis Handbook

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INTRODUCTION

The basic goal of the Ekopolis project is to support environmental education in a way that is motivating for the students. In our case, the learning process is based on a board game with a whole variety of follow-up activities and exercises. These can be done either by using worksheets in a classroom or on the internet website, www.ekopolis.cz. The website also contains a great number of additional materials supporting the whole project.

Ekopolis is designed for upper level grade school students. The experience with this game, however, shows that the game is also enjoyed by high school students or adults.

The goal of this educational game is to make the players think about the principles of spatial relations in urban context. The game features a valley in which players gradually develop their towns. Each player represents a mayor, whose aim is to build a functional town entirely according to the principles of the sustainable development. The reports of a whole range of Czech and foreign professional studies confirm that such games, based on simulations, positively develop students´ motivation to learn, and they are also an appropriate tool of introducing specific topics to students. A board game as such also helps to develop a whole range of key competencies, including communication, social and interpersonal skills.

How to Use this Handbook

The handbook is divided into several sections. In the general part, there is the description of game rules which were designed according to the way cities are developed within a particular environment. In other parts, there are concrete suggestions on how to introduce the game into the lessons, either as class work or homework.

GAME PRINCIPLES VS. REAL ENVIRONMENT

The following chapter describes the way in which the game principles mirror the aspects of every-day life. This information is necessary for proper understanding of the potential as well as the limitations of the game. Focusing on the distinction between the game principles and the real environment helps to clarify didactic goals of the project.

Nowadays, people heavily influence the environment they live in by what they do. The impact of such doings can influence either a small area (for example, air pollution in cities), a larger area (the extinction of certain predators in Central Europe), or even the entire world (global climate change).

Ekopolis focuses primarily on the consideration of such impact on a local level. In the descriptions of individual cards there are also references to the above mentioned impacts on a global level. Similarly, some cards represent the world events that are also visible on a local level.

The emphasis is put on the principles of sustainable development whose basis is the mutual harmony among the needs and requirements of economical, social and environmental nature. In other words, what we are dealing with here is a balanced development of economy, society and the environment.

In the game, this effort to balance the above mentioned parts of the whole system is signalled by various colours of the buildings that are placed on the game board by the players themselves and by the Action cards that are used. The red buildings mainly help the economical development: They provide jobs for the inhabitants and also utilities and products satisfying their other needs (for example, the production of energy, food, building materials, or sanitary products). The blue buildings provide accommodation and both social and cultural background. Green cards are used for the purposes of relaxation in the nature. At the same time, they more or less preserve green areas in the cities that mainly have ecological aims (they increase the air quality, they have water retention abilities, they are homes to animals that are also important for the environment, they decrease the noise pollution in the cities, and they preserve valuable soil, and so on). The word “building” is in here used in broader terms: The tag “building” also belongs to some green areas or objects that are of course not buildings in the real sense of the word. (This note mainly concerns the cards with the green buildings.)

The game principles are set in the following way: The best results are achieved by that particular player who best manages to balance all the individual aspects of the development by placing, if possible, the same number of Building cards of individual colours. This idea is further supported by the rule stating that a player gains other points for every complete triplet of Action cards. It is not only the player who influences his or her game: It is also the other players and luck that influence the game and the strategy.

The points that various players gain during the game are basically the representation of the satisfaction of the inhabitants of his or her city. The satisfaction thus depends on the people´s opportunities to earn more money, which means job creation, and also on the opportunity of quality accommodation located in nice environment and in the presence of basis institutions, like schools, and so on. Also, it is important that these aspects are balanced and, most of all, that neither of them decreases below a certain level. If the opposite happens, like the less jobs people have, or the less services, accommodation or quality of the environment, the less satisfied they are.

Red Buildings in the Game and in Reality

In the game, red buildings provide the satisfaction of material needs of the inhabitants. These buildings often bring financial gains and mostly a sufficient number of jobs as well. On the other hand, operating the red buildings also causes significant pollution in the area. In some cases, this negative aspect can be observed even in more distant areas or in the entire world (for example, emissions of green house gases).

The juxtaposition of red and blue (inhabited) buildings is definitely not desirable in the game, since even in the real world people do not want to live next to the buildings that cause pollution (not even the people who work in the red buildings). In the same way, neither their position next to the green cards is desirable because red cards usually devalue green areas. That is why, in both cases, a player gets negative points for this type of unfortunate setting. When having the most problematic buildings a player also has to place a pollution token on the adjacent area, which then represents a negative impact of these buildings on their environment. On the other hand, the juxtaposition of two or more red cards is advantageous, because, for example in industry, it enables the connection of various stages of production. It also represents the fact that in the neighbouring red buildings, the negative impact is less visible than in the neighbourhood of blue or green buildings. That is why the neighbourhood of two red buildings is awarded with positive points.

In reality, everything is clearly more complicated, since the degree to which red buildings disturb the environment is variable. This is expressed by various points granted for the juxtaposition of green and blue cards. In addition to that, this disturbance does not always have to be visible in the immediate neighbourhood of that particular facility. For example, a factory that consumes a great amount of electric energy in production does not have to have

an immediate impact on its surroundings, but at the same time the impact of its work in the area of the production of electricity can be significant.

In today´s world, thanks to a high degree of traffic serviceability, there are cities that cope just fine without the polluting red buildings, and people living in such cities can find jobs as bank workers, IT experts, teachers, gardeners, etc. It is, however, important to realize that even a city with no red buildings needs electricity, building materials, and other products that are produced by red buildings outside the borders of such cities.

Green Buildings in the Game and in Reality

Green buildings represent areas that, to various degrees, resemble the natural environment. Their impact on the environment depends on a concrete building, but in general it is less negative when compared to blue, and especially, red buildings. However, even green buildings can have a negative impact on its surroundings. For example, plantations and vineyards, if operated with chemical sprays, can be a source of water and soil pollution. In city parks and arboreta there are often invasive species of trees originating in other continents, which are thus displaced. They can then uncontrollably spread, often ousting out the original species or causing other kinds of problems.

Green buildings do not usually provide a lot of jobs, or they are limited by a particular season of the year. However, these are jobs that are natural and appealing for many people. Taking care of horses in the stalls, trees in the plantations, or ponds can seem more attractive for some people who do not like spending their work days in the office or at an assembly line in the factory.

It is convenient to place green buildings near blue buildings, since they enable the inhabitants of the city to relax every day in a nice environment closer to their homes. Also, the juxtaposition of two green buildings brings positive points, or, at least, no negative points. This state of things mirrors reality in the sense that when two green areas are adjacent to each other, it emphasizes their positive role in the environment. On the other hand, the juxtaposition with a red building is not desirable; for example, a children´s playground that is placed next to a factory cannot fulfil its recreational role. That is why a player gets negative points for placing the card next to a red building.

Blue Buildings in the Game and in Reality

Blue buildings represent residential buildings that provide the basic services for its inhabitants, such as shops, schools, hospitals, and so on. These buildings are best placed next to the green ones in which people can rest and relax every day. Also, the juxtaposition of two blue buildings is favourable in the game. In reality, the residential buildings next to those that provide services are also especially desirable. That is because the inhabitants use

these services and in turn their providers have customers. For exactly this reason, the cards representing services can bring a lot of points if placed next to other blue cards.

What is not desirable in the game as well as in reality is their position next to red buildings that pollute their surroundings or make life uneasy. In the game, this is represented by negative points - -in case of a multifunctional building and a market, a player gets no points.

So, the points that are given for various buildings reflect the dependence on the aspects of these facilities described above. For example, the passive houses obtain a lot of points for having the green buildings around, and, on the contrary, negative points for having red buildings around, since the passive houses are inhabited by people who care about their environment and healthy lifestyle, which is why they are more demanding on their surroundings.

Action Cards in the Game and in Reality

The Action cards of various colours are partially connected to the buildings of these colours, but mainly, they can influence the events (actions) on the whole game board. To a certain degree, they represent the connection of other events along with the development of the city. These events can be both positive and negative. In the game, these cards represent the element of chance that is loosely connected to the colour of a newly placed building. Green Action cards are mostly concerned with the impact of natural factors on cities or various ecological projects. Red Action cards are mostly concerned with the economy of the city, while blue Action cards represent social or political projects in the city.

Pollution and Protection of the Environment

One of the basic elements of the game is the effect of pollution. In reality, it means that human activities negatively impact the environment with the production of polluting substances. For example, when burning fossil fuels, the air is filled with carbon dioxide that contributes to the green house effect, and with sulphur dioxide and other nitrogen oxides that cause acid rain and other various types of pollution. When operating with pesticides on the fields, the soil soaks in these poisonous substances that then become present in the crop. The crop is then consumed by people or by animals in the soil, and this way the soil itself is ultimately devalued.

Pollution does not merely encompass the sole presence of poisonous substances in water, soil, or air. Pollution comes in many forms: Noise (acoustic pollution), electromagnetic smog (electromagnetic radiation caused by television transmitters, mobile phones or wireless internet signal), radioactive radiation or light pollution (light smog). All these kinds of pollution have, to a greater or lesser extent, a negative impact on living creatures, including people.

On the other hand, environmental protection in the game is represented by the placement of a special green tokens on the game board. The fact that some areas are more valuable than others in terms of natural protection is expressed by giving bonus points for the preservations of such important areas. In the game, such areas are represented by spaces with endangered species.

Protected areas are also declared according to the international agreements (for example, the bio spherical reservations of UNESCO or the Ramsar site that represent significant marshlands). Within the European Union there is the project Natura 2000 that aims to create a network of interconnected protected areas in Europe. In the Czech Republic, there are 38 preserved bird areas and 867 areas that are significant (if compared to European standards) and that belong to this network.

The above mentioned areas can also overlap each other (for example, the Ramsar site can be a part of Natura 2000, as it can lie in the area of protected landscape and its parts can also be named as a national nature reserve).

The environmental protection also involves safeguarding, especially protected species of plants and animals (See the Endangered species protection card).

Major Deviations of Ekopolis Game from Reality

Any kind of game is a simplified version of reality and, it is therefore not possible for it to grasp all the aspects of real life. Ekopolis, in some of these aspects, does not fully represent real situations either, and it is thus important to state this, so no misleading ideas can emerge. Most importantly, it is the fact that the foundation of brand new cities does not correspond to the reality of current European cities or towns: It was rather typical for the Middle Ages. Also, the development of the cities is quite accelerated in the game, since it involves phases that the Czech cities underwent for a few centuries (See The Development of Cities chapter).

Also, the game underestimates the role of agriculture and forestry, although, regarding their size, these branches belong to the most significant elements that influence nature. The experience coming from Scandinavia, for example, shows that with these fully functioning spheres, there is harmonic nature that does not have to be supplemented by parks or gardens, since forests or agricultural areas themselves are suitable for people´s relaxation. Ekopolis, however, is only concerned with the development of the cities: There are other games that focus on the development of natural landscape.

Last, but not least, the game does not pay any significant attention to aesthetics, despite it being a highly relevant, albeit subjective matter. When doing additional activities after the game – discussions, evaluations and so on – we should not, however, overlook this important aspect.

The Development of Cities

The first cities were founded in Egypt, Mesopotamia, and China. In the area of the Czech Republic, the cities were to the largest extent founded in the Middle Ages in connection with the development of crafts and trade. In the period of the Industrial Revolution, there was a rapid growth of the cities, since they became the centres of industrial production and people started to move to them from the country in great numbers. This was called the process of urbanization and it was due to a greater earning potential and a more comfortable way of life. Apart from the development of factories, there were also residential houses that differed greatly from country houses which had gardens but no floors. As a consequence, there were growing differences between the cities and the country. As people moved from the country, the cities rapidly grew. The lifestyle was different in the cities as well.

Apart from the advantages, city life also has disadvantages. Due to the high price of land or houses, people usually live in duplexes where they have to pay rent. Also, the quality of the environment decreases because of the industrial production in the area, increasing number of cars, or limiting opportunities for relaxation. During the 20th century, people realized these disadvantages and began to search for solutions. For example in the Czech Republic, it was especially cottages and summer houses where people went on the weekends or on holiday so they could spend some time away from the cities.

A slightly different development took place in the United States in the first half of the 20th century where living at a house in the suburbs seemed like the dream, the American dream. Apart from owning a home, success also meant possessing a car. The result of this phenomenon became suburbanization: The process of people moving from cities into suburbs. This phenomenon came to Europe and other parts of the world later to a lesser extent. In the context of the Czech Republic, it really became visible after 1990, in connection with the change of the political situation. During the last 20 years, there have appeared a great number of suburbs as well as huge goods depots that now are a symbol of commercial suburbanization: In other words, the transition of trade, production and other activities from the centre of the city to the suburbs due to a lower price of land.

Apart from the above mentioned suburbs and vast goods depots, there has been a growth in the number of large shopping malls and other entertainment facilities, and also traffic serviceability. Besides new roads and highways there are parking lots, petrol stations, roundabouts, etc. Newly built factories mostly focus on car production and electronics. A great part of such production is being transferred to developing countries, and that is why some factories with long tradition in the areas of the Czech Republic have been shut down in recent years. The empty places are called brown fields, which are areas that lost their original purposes and are now abandoned or rarely used. Some of them are then rebuilt as residential houses or have other purposes. Among other important buildings built in recent years are transmission towers for mobile phones and wind or solar power stations.

WHAT TO BE CAREFUL ABOUT IN THE GAME AND WHAT NEEDS TO BE EXPLAINED IN DETAIL

Before Starting the Game

Before starting the game, students should form groups, with each group having ideally four players. The game can also be played in groups of three or five. The game board can usually fit on one school desk: In case of smaller desks, you can push two of them together.

The initial setting is easy to create according to the picture in the game rules. It is important to state that in case of a various number of players, the setting of the City halls according to the icons on the game board changes at the start. In case of five players in a group, one of the City halls is placed on the square with a linden tree, with the player not having to take away any points. To be sure, it is good to ask the players the following questions: Does each of you have a City hall and three hexagonal buildings in your hands? Have you placed a scoring marker on the space 0 of the scoring track (scoring markers, in the case of the Full version)? Have you placed a pollution token on the round tracker? If all the answers are yes, then the players can start the game.

The Course of the Game

The way the game operates is intuitive: in the Basic version, each player places one building to his or her town and takes another Building. Then, the same is repeated by another player. In the Full version of the game, players also take the Action cards of the same colour as the colour of the building being placed; and also a player can get rid of one Building card.

Placement of Buildings

It is important to state that every new building must be placed only next to at least one already existing building, including the City hall. Students often tend to make mistakes when doing this. They sometimes place the building in the way that it is adjacent only to a green zone or pollution tokens that were placed in previous turns, and not to any buildings. If the students demand an explanation for this, you can mention the logic of power grids and sewerage systems when building a city.

Counting the Points

The most important rule that must be understood fully by the players is counting the points that the players get for a correctly placed building. You must not forget that for counting the points all you need is the numbers on newly placed buildings, not on the buildings in the neighbourhood. For every adjacent building the player gets points -- positive, negative, and sometimes even zero points. Students sometimes include the numbers on the already placed buildings for which they can no longer get points, so including these is incorrect. If they ask for an explanation, it is that the mayor gets points for newly laid projects only.

Sometimes students also forget the fact that apart from adjacent buildings they also get points for green zones and pollution tokens that are directly adjacent to newly placed buildings. Green zones count the same as green buildings. Pollution token count the same as red buildings, only with the following difference: It is impossible to get positive points for these, which is logical, because to have a building next to pollution token is definitely not an advantage. A player does not get any points for the placement next to an endangered species area or an empty square.

Green Zones and Pollution tokens

For placing a green zone a player does not get any points unless he or she manages to place it on an empty square with endangered species. If a player does so, he or she immediately gets three extra points. Students sometimes make the mistake not placing a green zone or pollution to a newly placed building. Only in cases in which there is no available place next to these buildings it is possible to place a token anywhere near the player´s city. Then this means that the token is placed on the square on which a player can place another building in his or her next turn.

Students sometimes also place tokens of a green zone and a pollution token first and then start counting the points they received previously for a newly placed building. At first, they are supposed to count the points for the buildings and then place the tokens in the green zones or pollution tokens.

Elimination of Pollution and Green Zones

The students sometimes forget the fact that even though there is a green zone or a pollution token on the field it is possible to place buildings on it. If a student places a building there, he or she immediately loses three points as a fine for getting rid of a green zone or as expenses that will be used in the future for clearing the pollution. This way, even though the game board is almost full towards the end, the game can still go on.

Events (Action cards) in the Full Version of the Game

In the Full version of the game, students sometimes forget to take Action cards. That is why it is important to emphasize that they are supposed to use the game turn overview card that can be found in five pieces in every game box.

Students also tend to forget that some Action cards do not need to be used immediately in the game but later – this is written at the bottom of every Action card. With some Action cards we must count how many of such coloured cards each player has on him or her. At this point, students may mistakenly count the number of buildings. That is why one has to distinguish between Action cards and Buildings at all times.

The End of the Game

Students sometimes may forget to move the token on the round tracker. If some problems emerge, it is possible to count which round of the game is actually going on, according to the number of placed buildings - every player places one building every turn. It is important to remember that with a various number of players, a various number of turns are played - the round tracker has icons as a reminder.

It is also important to remind the students that at the end of the game they get extra points for a well balanced city, since they can easily forget being excited during the course of the game. With the Basic version of the game, the points are counted together according to the buildings on the game board. With the Full version of the game, the points are counted for every collected triplet of Action cards. In this version, Action cards are collected, not the Buildings themselves, because when the cities of various players start to mingle, it is difficult to state who built what.

Frequently Asked Questions Regarding the Game Rules:

What are the numbers in the corners of the squares on the game board?

They tell you where to place the City halls according to various numbers of players. For example, if there are only three players, they place their City halls on the square that says three (a figure icon).

What are the symbols on the round tracker?

They tell you when the game is supposed to end, which is always different regarding the number of players. Players will realize that they are approaching the last turn in the game if the token which counts the rounds gets to the square with number 7, with the game being played by 4 people.

Why can´t I place my building behind the green zone that I built in the previous turn?

It is not possible because there is no infrastructure in the green zone (or in the pollution) that is needed for adding another building.

If my building is adjacent to other buildings of the same colour, how many points do I get?

Every adjacent building counts, so for example, if you place the building Passive house (with green +4 sign) next to three green buildings, you get as many as 12 points.

What if I get into a situation in which I have to place a pollution token, and next to my newly placed building there is no empty space other than a square with endangered species?

In that case you have to place a pollution token on this square and you have to take away three points.

Does a square with endangered species count as a green building when it comes to counting points?

No, it counts only as surrounding nature, for no points. Only if there is a green zone on the square with endangered species, it counts as a green building for the sake of counting points.

If I take away a pollution token from the square with endangered species, do I get any points?

No, you get points only if you place a green zone on the square with endangered species.

Is it possible to place buildings even over the river on the game board?

Yes, of course, it is possible. The river is only a graphical sign and does not play any real role in the game.

What does it mean exactly when you have to place a green zone or pollution token "anywhere near your city"?

In that case, it is possible to place the token on any square on which a player might place another building in the next turn.

OTHER VARIETIES OF THE GAME

Other varieties of the game are just additional; we primarily recommend working with the Basic and the Full version of the game. You can even combine any of these varieties, or make up your own ones. It is important to let the students know that the constructed cities always change according to the various rules of the game.

A. CITY AS A BUILDING KIT

This variety of the game is mainly intended for younger students (7 – 11 years old) for whom counting the points in the Basic version is too complicated.

This variety can also be used for slightly older students if they work on a group project of constructing an ideal city. However, it is important to point out the limits of the game model that certainly does not cover all the aspects of modern urbanization process. On the other hand, it also provides an opportunity for the discussion about what problems were not solved by the constructed cities - as transportation or security.

The task for a group of students is then to build a functioning city from the available buildings: A city in which people can have a place to live, work, and rest. These places should not be directly next to factories, but at the same time they should be near parks.

First, place a stack of cards next to the game board. The game should be started by the oldest student. He or she takes one card from the stack and places the card anywhere on the game board. After this, other students start to play clockwise. The game is then finished when the game board is entirely full. The tokens of trees and pollution can be placed anywhere on the game board, just to improve the city aesthetically after the end of the game. No points are counted in the course of the game.

After the end of the game, students have to introduce their city to the others and they should also answer the following questions: Which is the best place to live in the city? And what is the worst place to live? Where do the inhabitants go to work? From where do they obtain electricity in the city? Where is the best place to go for a walk?

The whole classroom can then vote for which city would be the best for living.

B. STRATEGIC VERSION

This strategic version is intended for more experienced and competitive students who prefer to limit the role of luck in the game. This game is quick and popular even among adults. We recommend playing it repeatedly and counting the points for every victory together.

The game is played according to the rules of the Full version; however, the Action cards do not influence the course of the game in any way. The players collect these anyway, but only in order to know what buildings they have made to collect triplets. Only the colours of the Action cards are important, so you can have them turned over for the entire time.

After every turn, a player can throw away all the Building cards and take three new ones.

C. TRADE FAIR OF BUILDINGS

This version is intended for more experienced players who already know the game very well. The game is played according to the rules of the strategic version only with the following adjustments:

Before the game, place all the cards facing down and mix them. After the signal that the game begins, all the players can begin to turn the cards and take the buildings. Once a player takes a card, it cannot be put back.

Every player has to take the number of cards that equals the number of rounds in the game plus 3. For example, when there are 4 players engaged in the game, each player has 10 buildings.

Each player then mixes the cards he or she gained. These cards then form the stack from which he or she takes the initial card and also the new buildings. If this stack is finished, the player mixes his or her thrown-away buildings and forms a new stack of buildings out of them.

D. AUCTION

This version is intended for older and more experienced students who want to know how auctions work. The game is played according to the rules of the Strategic version, only with the following adjustments:

Before starting the game, players only draw two buildings and place their scoring marker on number 10.

Before the beginning of the individual turns, there must be as many buildings on the table as the number of players. The player who goes first points out the building he or she would like

to take. The player who follows (clockwise) can either show a complete lack of interest in this building, or offer some points for it. The other following player can either show a complete lack of interest as well, or offer points for it: These points, however, have to be at least by one higher than the previous offer was. The auction then continues to the point in which after the offers all the players say they are not interested. The player with the latest highest offer then gets the building, and also takes away the appropriate number of points. In this turn, he or she cannot take part in the auction any more.

The auction then continues until all the players get one building. Until a building is gained by the player who began the game, he or she is the one who gets to pick first. If he or she gets a building, the player who sits left is the one to pick.

During the game, a player cannot throw away any buildings or take any in a different way other than in the auction.

At the beginning of another turn, there is also an auction in which all the players add more to their buildings. The auction (and also the following placement of the buildings) is started by the player who has the lowest number of points, and then the game is continued clockwise. When all the players have the same points, the youngest player of all starts the game. Just to be well arranged, we recommend placing a red token or some other signal in front of the player who starts the turns.

E. CENTRAL CITY

This version is intended for those players who want to know how the game would look like if the initial conditions have changed.

The game is played according to the rules of the Basic version or the Strategic one (it depends on what the players agree upon) with the following adjustments:

Instead of the starting City halls, each player places two City hall tiles on two places in the middle of the game board. These are shared by all the players, but points are counted individually. It is really important to remember whose scoring marker is which because the players do not have a City hall of their own.

F. HIGH DENSITY OF POPULATION

This version is intended for those players who would like to try how the game could end if the time of the game lengthened. It is good to mention that in many countries around the world the population density is much higher than in the Czech Republic, with there being both equal consequences.

The game is played according to the rules of the Basic version, Full version, or Strategic version (it depends on what the players agree upon) with the following adjustments:

The end of the game happens one turn later than it is stated on the round tracker.

G. DUEL

This version is intended for those who would like to play the game as long as possible. It is also suitable at times when there are only two players.

The game is played according to the rules of Full version, or Strategic version (it depends on what the players agree upon) with the following adjustments:

There are only two players. They place their starting City halls on the square with number 2 on the game board. The game finishes after 14 rounds.

H. BRIDGE (A TEAM PLAY)

This version is intended for those who would like to play the game in pairs competing against each other. This version allows you to practice the communication with your partner, in order to gain as many points as possible together.

The game is played according to the Full or Strategic version (it depends on what the players agree upon) with the following adjustments:

Players must divide themselves into groups of two. Every group shares a scoring marker. Each player starts with his or her own City hall and develops his or her own city, but the points are counted together as for one team. The City halls of the team mates should not be placed all the way across the game board. They should be placed in the neighbouring corners. At the end of the game, the overall success is determined by how well the teams cooperated.

DEFINITION OF SELECTED TERMS AND PHENOMENA

In this chapter, the definitions of selected terms and phenomena that mainly concern the buildings and Action cards are offered. The definitions of other terms can be found either on the cards that are connected to these themselves, or in one of the dictionaries (See the list of used or recommended literature).

Biodiversity

It expresses the diversity of wildlife. It can be described either as a number of species that inhabit a certain area (ecosystem, state, continent or the whole planet), or as a diversity of ecosystems, varying from larger to smaller degrees (breed, races, subspecies, variety, or cultivated variety). So far, there have been 1.75 million species of plants and animals studied and described, however, according to some estimates, there are 5-50 million kinds of live organisms living on the planet.

Human footprint

It is the area of land that is needed to secure resources and to dump waste. It can be counted for individuals, cities, or states. It is one of the indicators that express and compare the impact of human activities on the environment. From the calculations done regarding the human footprint it is possible to state that if all the people on the earth had the same life style demands as an average person in the Czech Republic, one planet would not be enough and we would have to have at least two. And if people had the same lifestyle demands as an average person in the United States, we would even have to have five of them. The high living standard in developed countries is thus conditioned by the significantly lower living standards in developing countries.

Ecosystem

It is a part of landscape that involves a certain area and the organism living in it. These are connected by mutual bonds and form one functioning unit. Individual species of plants and animals are in the ecosystem linked by food chains: they influence their environment and are also influenced by it. Ecosystems can be purely natural (a forest meadow), semi-natural (agricultural forest) or artificial (better to say, unnatural, as for example people´s residence).

Emissions

These are substances polluting the environment. The term is mostly used in connection with the atmosphere. In the place of the immediate effect they are called imissions. Nowadays there are 230, 000 tons of sulphur dioxide (before the desulphurization of thermal power stations, which was at the beginning of the 1990s, it was even more than 1 500 000 tons!) 200, 000 tons of nitrogen and 130 000 000 tons of carbon dioxide produced every year in the Czech Republic.

ERoEI – Energy returned or Energy Invested

It is the ratio of energy invested and energy returned from a certain source. For gaining a new source of energy it is necessary to invest some. The figures of ERoEI vary a lot for different sources (see below). If the figure of ERoEi is below 1, it means that getting energy from this source is energetically unprofitable.

Oil when it was first discovered as fuel	100
Oil in Texas around 1930	60
Oil in the Middle East	30
Other oil	10-35
Natural gas	20
Quality coal	10-20
Low-quality coal	4-10
Hydro power plant	10-40
Wind Farms	5-10
Solar energy	2-5
Oil sands	max. 3
Bituminous shale	max. 1.5
Agro fuel (in Europe)	0.9-4 (depends on the crop)

Source: Cílek, Kašík (2007)

Note: Oil sands and bituminous shale represent so-called nonconventional oil. That means that they are raw materials from which it is possible to gain oil but by investing a great deal of energy and significant landscape alterations. That is why the energy returned is so low. Mixing the data about the oil supplies which can be gained from these sources with the data about the conventional oil supplies produces misleading (overestimated) evaluations of oil reserves on the planet.

Externalities

These are financial expenses that are paid by somebody else than by the person who causes them. A typical example is the removal of the consequences of the polluted environment. A great deal of externalities can be mentioned in the connection with transportation, especially with cars (see The impact of transportation on the environment). The term

"external" means "outside", since the bookkeeping of those who cause these problems does not show any evidence of these expenses.

Fossil fuels

These are energetically rich raw materials that emerge by the long-term storing of organic materials. The most important of these are coal, oil and natural gas. They are used mainly for heating buildings or water, or in combustion engines (in transportation) and in electricity production. Their incineration then produces a great deal of green house gas.

In 2007, 62.2 million tons of coal were extracted in the Czech Republic (which makes the fifteenth position in the world, with the first one being China with 2 536 million tons). At the same time, around 223 000 barrels of oil were used daily (which makes the Czech Republic the 56th country in the world, with the first one being the United States with 19.5 million barrels of daily oil consumption). One barrel is approximately 159 litres. In addition to this, in the Czech Republic alone, 8.6 billion m^3 of natural gas is used every year (which makes the 47th position in the world, with the United States with 650 billion every year being the first).

Globalization

It is a process of increasing interconnection of the world. It easies the transmission of information, trade and mutual contact among various cultures, but it also causes a lot of problems: there is the uncontrollable influence of international companies, spreading of geographically alien species, and significant growth of transportation (with all its negative impact), also in various parts of the world there are conflicts between the original inhabitants and immigrants, local traditions and cultural heritage is easy to lose and so on. The process of globalization is supported mainly by modern technology that makes transportation and transmission of information much easier.

Global problems

They are problems that concern the whole planet. Among the most important, there are the global climate change, extinction of biological species, degradation of soils, pollution of the oceans, the lack of drinking water, poverty, and unbalanced living conditions of the inhabitants of various parts of the world and so on.

Global climate change (sometimes mistakenly called global warming)

This is climate change that affects the whole planet. A long-term climate fluctuation is a natural phenomenon - changing of glacial and inter-glacial periods is a clear indication of it. In the last decades, there have been such deviations of climate that are regarded as exceptional. In the last 140 years, there has been a rise in the temperature throughout the whole world by 0.8 degree of Celsius and the pace of this rise keeps increasing. It however differs in various parts of the world: the greatest increase in the temperature is observed in

Arctica: on the other hand, in some parts of Europe there is a slight decrease. That is why it is not appropriate to use the term “warming”, but rather a global climate change. Other potential increases in the temperature can have catastrophic consequences, as for example the ocean level rise, increased frequency of catastrophic events like floods or long-term droughts, disturbance of the balance of ecosystems, extinction of some biological species and, on the other hand, excessive reproduction of others, massive migrations of people from some parts of the world and so on.

There are continuing discussions about to what extent people influence these changes, but according to most climatologists it is highly probable that human activities have a crucial impact on increasing the temperature throughout the world. The increasing concentration of green house gas in the air is considered to be the root cause.

Geographically alien species

These are the species of plants and animals that were spread, either intentionally or unintentionally, outside the area of their origin. Some of them could then become invasive.

Invasive species

These are the geographically alien species that in the newly inhabited area start to spread uncontrollably, often on the expense of the original species. The most popular example from the past is the rabbits in Australia: nowadays, we can find some invasive species on all the continents, including Antarctica. The biggest problems with them happen on smaller, isolated islands where they mostly cause the extinction of the original species that could not be found anywhere else (so-called endemits). Also in the Czech Republic, there are problems with some invasive species (as giant hogweed, or rose acacia) and animals (Spanish slug, or American mink). A typical example of biological invasion was spreading of Colorado potato beetle in the post-war Europe that was interpreted by communist government officials as a malicious attack of Western powers.

Non-renewable resources

These are natural resources that can be found only in a limited amount and after their consumption they cease to exist. A typical example is fossil fuels.

Renewable resources

These are natural resources that can be renewed if they are used consciously. Typical examples can be wood, water or sea fish. By irresponsible usage of these renewable resources it is however possible to deplete even these. This happened, for example, with some sea fish that were being fished so intensively that their populations were then unable to replenish.

pH reaction

It is a degree of acidity of the environment, established by the concentration of hydrogen ions H+. Its value influence the way in which basic mineral substances appear in soil and water. They also influence various processes in the cells of living organisms. These organisms, used to a certain value of pH, are not capable of living in an environment with other values.

Green house effect in the atmosphere and green house gas

The key to the green house effect in the atmosphere lie in the fact that the green house gases (see below) enable the sun rays to reach the surface of the planet, but at the same time they halt long-wave radiation that is incidentally radiated by the surface, so it prevents its escape to the space. This phenomenon is very similar to processes that take place in the green house.

The green house effect itself is a natural phenomenon: thanks to this, there are temperatures on the planet that make the life on it possible. Without the green house effect, the temperature on the planet would decrease by approximately 33 degrees Celsius. The problem is now that the increasing concentration of the green house gases leads to the growth of the green house effect, which can have serious consequences.

The most important of the green house gases is steam. Its ratio in the atmosphere is not very influenced by human activities. What is however influenced by human activities is the concentration of carbon dioxide (CO_2), methane (CH_4) and nitrogen oxide (N_2O). The greatest amount of green house gases gets into the atmosphere due to the burning of fossil fuels (especially true for carbon dioxide), to smaller extent also due to agricultural activities (growing rice, animal husbandry, which produces methane), due to cement production and so on.

Increasing the concentration of the green house gases in the air is also caused by changes in landscape, especially deforestation. That is because vast forest areas are able to rid the atmosphere of those green house gases. The increase of the concentration of carbon dioxide is a result of the disturbance of natural processes involving carbon that was long contained in fossil fuels and now it is being released to the atmosphere very quickly. In one year, the population of the planet releases the same amount of carbon that the fossil fuels have stored for 500, 000 years. The content of CO_2 in the air has been systematically measured since 1958 which was the time when it reached around 315 ppm (1 ppm equals 0.0001 %). Nowadays, it reaches around 385 ppm and still increases at the same speed. According to some estimates, before the Industrial Revolution the concentration of CO_2 fluctuated between 180 and 300 ppm in the long-term.

Sustainable development

It is an approach whose basics lie in mutual balance among the economics, society and environment (in economical, social and environmental aspects). One of its goals is to sustain good quality and stability of all the aspects of the environment and natural resources for future generations. These generations should, according to the principles of sustainable development, should have the same or even better conditions than we have in today´s world.

The impact of transportation on the environment

Transportation has lately been one of the main factors that contributed to the decrease in the quality of the environment. Among the most significant negative impacts there is releasing of pollutants to the air (see green house gases), noise, vibrations and occupying land. Transportation is also very demanding when it comes to utilization of raw material, especially oil. Roads are also significant barriers for many organisms, because of their frequent movements. For other organisms on the other hand, roads are a way of their spreading quickly, often with catastrophic results (for example, for the invasive species). Generally, the greatest burdens for the environment are cars and planes, especially when used for the transportation of individuals.

The transportation, especially the terrestrial one, is characterized by a significant presence of so-called external expenses. These can be, for example, expenses for building anti-noise barriers, building roads and sustaining them, treating people´s neuroses caused by noise, their allergies got from polluted air and so on. According to calculations, every kilometre that a car passes represents an amount of 2.50 Czech crowns (around 10 euro cents) of external expenses that are most probably paid from the budget of the state (that means they are shared by all the people who pay taxes, regardless of to what extent they use cars themselves), or they are shared by those people who are constantly harmed by the transportation (for example those who live near the roads).

The impacts of the transportation on the environment could be lessened especially by using economical ways of transporting (going on foot, cycling) and by preferring public transportation (especially trains or trams) that is about five times less energetically demanding than road transportation. Also, the impacts of the transportation of goods could be possibly lessened by eliminating those absurd, long-distance transports. Actually, this problem can be partly solved by every one of us, for example by supporting local produce.

HOW TO USE EKOPOLIS IN CLASS SETTING

In this chapter, you can find concrete suggestions on how to include the Ekopolis project, including the follow-up activities, into the lessons. Some of the materials come in a form of ready-made comprehensive work sheets.

Following, you will find suggestions for completing the project in four basic lessons, and an alternative (abridged) version for three lessons. In the methodical part, you will find extension suggestions for additional lessons with Ekopolis (work sheets related to some of the Action cards and Building cards). These suggestions serve as a point of reference only and teachers are, of course, encouraged to adjust them to include their own ideas.

The Basic version

Characteristics of each lesson:

1. lesson – motivational. Familiarizing with the community in which the student lives and clarification of terminology (city status, lord mayor, heraldry); explanation of the meaning of the colours of the individual buildings types (urban buildings – blue, industrial – red and recreational and environmental – green); explanation of the term "sustainable development"; rules clarification; characterization of less frequent buildings.

2. lesson – explanation of the basic game principles excluding the Action cards; the game itself – cooperative version; home preparation: practising the rules on the webpage www.ekopolis.cz

3. lesson – going through minor ambiguities in the rules and playing the competitive version of Ekopolis including the Action cards.

4. lesson – evaluation of the knowledge gained in the previous lessons; suitability of living in reach of the different building types; description of the situation in the community in which the student lives; a characteristic and a description of an ideal city; possibilities of changing things in one's community; goals assessment; evaluation of the form on the web page www.ekopolis.cz

The lesson structure is based on a three stage learning process E-U-R (E-A-R, evocation – awareness – reflection)

1. lesson suggestions

The introductory lesson should be about motivation and recapitulation of the knowledge of one's community, environmental issues and sustainable development gained insofar. The fact that the players will act as mayors whose goal is to build a balanced city can be used as a motivational tool. Students react in a very positive manner to this particular aspect of the game and quickly fall into their character. If the game is repeated several times, the motivational power of this aspect can fade away and it is therefore recommended to reinforce it repeatedly by allowing city names, coat of arms, flags and other items. This aspect is included in the first worksheet *How does a city work?* In the first lesson the students will learn about sustainable development principles, colour distinction of the different building types (civic amenities and housing – blue, industry – red, recreational and environmental buildings – green) and the function of more complex buildings will be explained. At the end of the lesson a teacher may start explaining the basic rules of Ekopolis depending on the time left.

First lesson:

- ✓ Working with a worksheet (learning the basic terminology; building types – red, green and blue; information about less familiar buildings)
- ✓ Familiarizing with the rules

Homework follow up: heraldry

How to work with the worksheet 1 *How does a city work?*

1. Introductory discussion and learning about the project (5 minutes):

- ✓ First, read through the motivational text with your students, and then tell them how much time they are going to spend on it.

2. Community we live in (15 minutes)

- ✓ This part of the worksheet is based on the information that the students know and it should not be a problem for them to fill the gaps in the text. The first part of the worksheet aims at motivating the students to find additional information about their community, see later (coat of arms, flag and the history of the community). This is followed by an explanation of important terms as township, corporate town or regional capital. These terms are explained below in the text.
- ✓ Worksheet briefly introduces functioning of the municipality council and regional council. This discussion can be very particular, especially in smaller municipalities where the children know their mayor personally.
- ✓ Explanation of the term lord mayor (corporate town mayor).

- ✓ Homework: draw or print, cut out and prepare the town's coat of arms and explain briefly what it means. This is followed by the explanation of the terms heraldry and coat of arms – see the text in the worksheet

3. City buildings (15 minutes)

- ✓ This task is designed to prepare for the game itself
- ✓ Read the text describing the task with the students.
  - o First, students underline the buildings that can be found in the place where they live.
  - o Then they fill in two buildings that are not in the table. First, they do it individually and then in pairs. Finally, a teacher writes the name of the buildings named by the students on a blackboard.
- ✓ What is SD (Sustainable Development)
  - o Read the text explaining the term with students.
  - o We recommend explaining the term to students once more, since it can be tricky, especially for younger students.
  - o Then students working in pairs fill in the buildings according to their colours in the table above (civic amenities and housing – blue, industry – red, recreational and environmental buildings – green)
    - Industry – red buildings: brewery, factory farm
    - Civic amenities and housing – blue buildings: health centre, school, tower blocks
    - Recreational, natural buildings/areas – green buildings: forest park, horse ranch

4. Less familiar buildings (5 minutes)

- ✓ In this part of the worksheet, students will learn less familiar buildings with which they will need to work during the actual game. The buildings whose operation is often unclear to students were chosen.
  - o Game Preserve – enclosed area often in a forest used for breeding the game (deer, warthogs etc.)
  - o Organic farm – area where agricultural plants are grown or animals bred on a much smaller scale, but with better quality and according to the organic standard
  - o Multifunctional buildings – buildings which serve more purposes (shops, cinemas, apartments and offices)
  - o Forest park – large wooded area which resembles natural environment, designed for longer walks
  - o Passive house – houses with very low or even no energy consumption
  - o Orchard – area where fruit trees grow

- Arboretum – a specific type of botanical garden with emphasis on trees and shrubberies

5. Introduction of Ekopolis (5 minutes)

- ✓ In this part, introduce the general principles and rules of the board game.

2. lesson

In the second lesson students will learn the principles of the game, clarify specific situations which they can face during the game and they will be able to play one round of cooperative game excluding the Action cards. The lesson gives students the opportunity to try the game and familiarize themselves with it. The lesson is followed by homework which can make use of the web page www.ekopolis.cz. The following lesson, they will play the Full (competitive) version of the game including the Action cards.

The second lesson:

- ✓ Check the homework regarding heraldry
- ✓ Explain the rules excluding the Action cards
- ✓ Playing a round of cooperative version of Ekopolis, familiarizing with it

This part can be followed by homework making use of the web page www.ekopolis.cz

3. lesson

The third lesson is dedicated to an actual round of the game which takes approximately 35 minutes. The remaining 10 minutes are used for organizational purposes (checking homework, further explanation or revision of the rules, dividing players into groups, adjusting the classroom, preparing the game board and a final clean up).

Each of the groups play at the same time and a teacher should be present to clarify the rules, resolve arguments etc. In the remaining time, he or she can draw students' attention to interesting connections between Building cards and Action cards and the real world. After the game is finished, it is recommended to take a picture of each of the game boards to allow for the revision and analysis in the following lesson.

4. lesson

The final lesson is aimed at summarizing the information from the game and assessing how much students have learned. The lesson consists of two parts. Worksheets are available for two versions. The first version is designed for 6th and 7th grade and the discussion worksheet includes ready-made questions which are missing from the other version (8th and 9th grade). Older students can make use of topic areas in parentheses below each question.

The fourth lesson is divided into two parts

- ✓ Work with the worksheet (evaluation of the knowledge gained in the previous lessons; suitability of living in reach of the different building types; description of the situation in the community in which the student lives; a characteristic and a description of an ideal city)
- ✓ Assessing the acquired knowledge – Worksheet 3: *What do you know about a city?*

Guidelines on how to work with the Worksheet 2: *Our City in Ekopolis?*

1. Where we live and where I want to live (20 minutes)

- ✓ Worksheet 2 comes in two versions: the first is for 6th and 7th graders (they include instrumental questions regarding the task Where we live and where I want to live) and the second is for 8th and 9th graders (with instrumental topic areas regarding the task Where we live and where I want to live)
- ✓ Read the motivational text and the instructions for the first task with students.
- ✓ Students will form pairs each of which draws a colour of a building it will focus on. In the worksheet, students can find ready-made topic areas which can help them to come up with an argument. The work is done in pairs and after five minutes the results are consulted with the other pairs with the buildings of the same colour. After a while, each of the groups will present their opinions and observations and other students will write them down in their respective worksheets. Then there will be time for a short discussion about the particular building type.
- ✓ Explain to the students the importance of taking notes into their respective worksheet in order to be able to present clear arguments.
- ✓ When students from higher grades answer the question "Why?, a clear and comprehensive answer should be required. Do not accept only a general fact, but require them to list their reasons. The goal of this part, apart from the reflection, is to teach the students to express themselves intelligibly and to support their opinions by arguments.

2. An ideal city

- ✓ Read the motivational text and instructions for the students.
- ✓ Students are then to be asked to circle 15 buildings significant for a city life from the list.
- ✓ Each student then chooses two the most significant buildings which he or she thinks are missing in his or her city and writes them under the text.
- ✓ After that the teacher writes the buildings chosen by the students on the blackboard. Then the students should vote. Two buildings with the most votes should be written in the lines under the list.

3. Final discussion and goal assessment

- ✓ Try to help the students think about ways in which they can influence the functioning of their city (elections, official bulletin board, objection process), adjust the information given to the students' age.
- ✓ Recommendation: It is possible to write an official letter to the mayor based on the results of the vote in the classroom. It is important to reason why the students feel that they need the particular building and what positive influence it could have for the city. This activity can be used in language stylistic lessons.
- ✓ Worksheet 3 summarizes the goal and reaffirms their completion. Explain the students the necessity to answer briefly and clearly. It is suitable for the students to fill in the text on their own. Explain to the students that there are some questions which cannot be answered incorrectly. (If there is not enough time at the end of the lesson, it is possible to assign the worksheet as homework.)
- ✓ Evaluate all the four lessons (if students liked the lessons, what they found the most challenging, how they liked working with the worksheet, what they learned etc.)
- ✓ Tell the students about the web page www.ekopolis.cz, where they can find additional activities and useful information.

WORKSHEET 1:
HOW DOES A CITY WORK?

Name: …….

Basic version

Date : …….

Class: …….

In the next few lessons, you will have the opportunity to become a mayor of a city. You will have to make decisions about constructing buildings of such significance as are tower blocks, parks, schools, but also nuclear power plants or slaughterhouses. You will learn the basic principles of city's working and this worksheet is designed to prepare you for the responsible position of a city mayor.

Good luck!

COMMUNITY we live in?

Fill in the missing information in the text and answer the following questions:

What is the name of the municipality you live in? …….

Municipality you live in has a status of ... ? (choose from the following options and fill in the sentence):

village **town** **regional capital** **capital city**

Clarification of the terminology:

- ✓ **Village** (or a hamlet) is a countryside domicile.
- ✓ **Town** is bigger than a village and it is usually granted a special status by law. A town can consist of several former towns or include surrounding villages not considered to be independent municipalities.
- ✓ **Regional capital** is a city which is by law specified to be a seat of a regional government.
- ✓ **Capital city** is a status that is granted by a specific law. Capital city is the seat of government. Capital cities are usually divided into several city wards.

Fill in the text:

Mayor of our (*fill in the status)* …….. is ……. and was elected into the municipality council for a (*party/movement*) …… The municipality lies in ……. region, the capital of which is …… and the regional governor is…… .

Choose the correct answer from the following alternatives:
Who is usually the highest-ranking official in a town:

a) Town President
b) Town Mayor
c) Town Chairman
d) Town Elder
e) Else: …….

City’s coat of arms

As homework, find a coat of arms of a city you live in, or a city which lies near the place you live in. You can either print or draw the coat of arms. Find the explanation of what the coat of arms represents:

Coat of arms (*fill in*): ……	Short explanation of its meaning:

City’s coat of arms is one of the emblems of a city used for representation. It is usually a depiction of an item, action or combination of several smaller depictions in a simplified manner. The shape is derived from the shape of nobility’s coat of arms.

Heraldry is an auxiliary historical discipline which engages in the study of a set of rules and customs which determine the creation, description, designation and workmanship.

Buildings in a city

Below you can find a list of buildings which may or may not be found in the city you live in or which lie near the place you live. Underline the buildings that you can find in that city. Finally, add two significant buildings which are missing from the list. First, check and discuss in pairs if you have underlined all the significant buildings of your city. Then, when asked by a teacher, discuss it with the whole class. The teacher should write the buildings missing from the list on the blackboard and you should write them down if you have not done so yet.

Health centre	Horse ranch	Factory farm
School	Brewery	Tower blocks
Forest park	……..	……..

Do you want to win in the Ekopolis game? Then pay attention!

What is SD?

Sustainable Development (SD) *is the development of the human society which balances commercial (economic) and social progress with environmental protection (environmental point of view). It is therefore a balanced development of commercial, social and environmental welfare of the society.*

It sounds complicated, but in other words it means the following: People living in a city are satisfied if they have job opportunities, and accessible housing, schools or health care and, of course, relaxation. All this should be balanced in order to preserve the environment for the future generations. That is why it is necessary to have all types of buildings in a city.

To simplify it, we can say that there are three types of buildings:

1. Economically important, industrial – **red**
2. Civic amenities and housing – **blue**
3. Recreational, natural – **green**

It is impossible to employ all inhabitants in city parks and orchards. Do not forget the SD! **Go back to the list of buildings and label the buildings with colours according to the characteristics above.** You can work in pairs.

Less familiar buildings

In playing Ekopolis you will learn a wide a range of interesting and often less familiar buildings. The list of the more troublesome buildings follows. **Match the descriptions to the names of the buildings:**

A	Multifunctional house		enclosed area often in a forest used for breeding game (deer, warthogs etc.)
B	Arboretum		area where agricultural plants are grown or animals bred on a much smaller scale, but with better quality and according to the organic standard.
C	Game Preserve		buildings which serve more purposes (shops, cinemas, apartments and offices)
D	Orchard		large wooded area which resembles natural environment, designed for longer walks
E	Organic farm		houses with very low or even no energy consumption
F	Passive house		area where fruit trees grow
G	Forest Park		specific type of botanical garden focused on trees and bushes

WORKSHEET 2: OUR CITY IN EKOPOLIS

Name: …….

Date: ……. Grade: …….

You have played a round of Ekopolis. We hope that you enjoyed playing it and that you will play it some more. Now, it is necessary to go through the individual parts of the game.

Where I live and where I want to live

Listen carefully to your teacher's instructions:

Write down your observations and facts about the building which has been assigned to you. It will help you to support your opinion and you will not forget what you wanted to say. Notice the topic areas in the parentheses; they should help you to find good arguments. When the class discusses the problem together, fill in the information about other buildings as well.

Circle the correct answer – YES / NO

<u>RED BUILDING</u>: Do you want to live in the vicinity of an open-pit mine? YES NO

In what ways does this building affect the lives of the people in the surrounding cities (air pollution, disease, noise etc.)?

……

……

……

Can many people find a job there? Do you think it can actually lower the unemployment?

……

……

Have you ever seen an open-pit mine? What do we extract from it?

……

……

<u>BLUE BUILDING</u>: Do you want to live in the vicinity of a shopping street? YES NO

In what ways does this building affect the lives of the people living nearby (civic amenities, noise, housing prices etc.)?

……

……

……

Can many people find a job there? Do you think it can actually lower the unemployment?

……

……

Which types of businesses can you find in a shopping street? Are there any negative effects?

……

……

<u>GREEN BUILDING</u>: Do you want to live near a forest park? YES NO

In what ways does a forest park affect lives of the people living nearby (air pollution, disease, noise etc.)?

……..

……..

……..

Can many people find a job there? Do you think it can actually lower the unemployment?

……

……

If the park is not maintained properly, can it be in any way dangerous (especially in big cities)?

……

……

Ideal City

You have completed a city on your game board and now you can stop and think about how a city you would like to live in should look like. Let your imagination loose.

Circle 15 buildings which you would like to have in your city in the list below. Keep in mind all the different types that are important for peoples' lives and also the SD (sustainable development)

List:

Red buildings	**Green buildings**	**Blue buildings**
Nuclear power plant	City park	Tower blocks
Open-pit mine	Fish pond	Passive houses
Logistics park	Arboretum	Satellite house
Airport	Forest park	Apartment blocks
Cement works	Vineyard	Multifunctional house
Coal power plant	Orchard	Family houses
Brewery	Inline park	Retirement home
Factory farm	Horse ranch	Shopping street
Bus station	Game preserve	School
Car factory	Natural playground	Health centre
Slaughterhouse	Organic farm	Marketplace
Chemical plant	Open air pool	Sports facility
Steel mill		Theatre
Sawmill		Church
Gas power plant	**Which of the buildings that you have chosen do you miss in your city? Write down the two most important:**	
Electronics plant		

Now write all the named buildings on the blackboard and choose two buildings that all the students in the class miss and that you would like to have.

The class has chosen: ……. …….

And a final question to make you think. Can you yourself in any way influence the life in your community and what buildings are to be constructed?

……

……

……

……

……

……

……

……

WORKSHEET 3: WHAT DO YOU KNOW ABOUT YOUR CITY?

Name: ……. *Final summary*

Date: ……. Grade: …….

This final worksheet will summarize all the things you have learned about a city's operation, organization, and the SD over a few last lessons. Read the instructions carefully.

What is the name of the mayor of the city you live in?

…….

Choose the correct description of what the sustainable development (SD) represents:

The sustainable development is a set of guidelines for society's development which…:

a. Focuses on economic development.
b. Balances economic and social development with the environmental preservation.
c. Focuses on traffic limitations in cities.
d. Focuses on the environmental preservation exclusively.

In the table below, you will find different buildings. Tick the correct type of the building. Use the last two lines to write down two other buildings and then tick the correct type of the building:

The buildings	Civic amenities, housing	Recreational and natural buildings	Industrial, economically productive, buildings
Health centre	☐	☐	☐
City park	☐	☐	☐
Car factory	☐	☐	☐
Post office	☐	☐	☐
Waste burning facility	☐	☐	☐
High school	☐	☐	☐
Woodlands	☐	☐	☐
……..	☐	☐	☐
……..	☐	☐	☐

Choose any industrial building and describe its impact on, and importance for, your community. Make use of the instrumental questions, answers should be short but clear:

Building you have chosen: ……..

Negative effects on its surroundings: ……..

……..

Positive effects on its surroundings: ……..

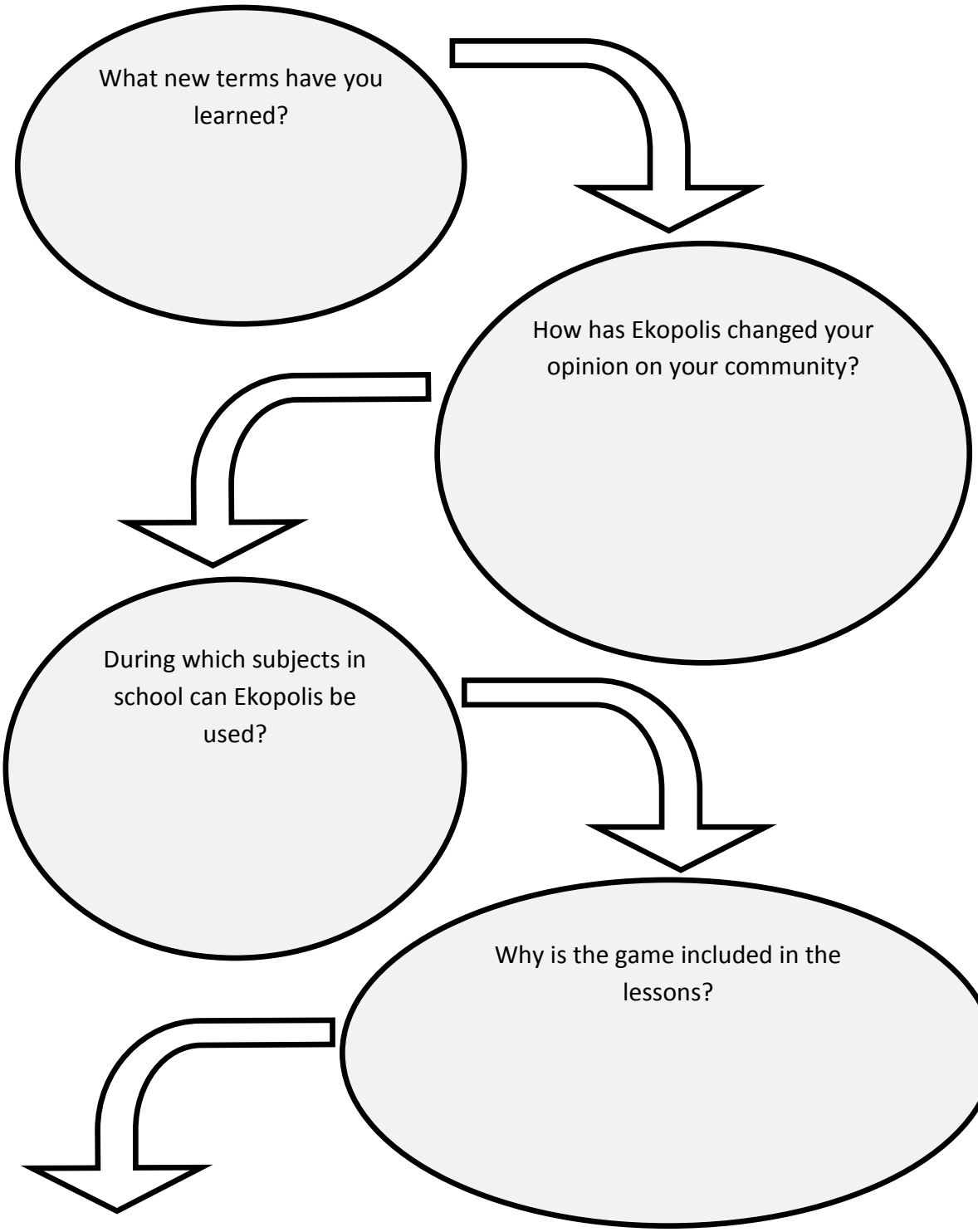
……..

Now fill in the questionnaire about the citizens' satisfaction:

Questionnaire for the municipality (fill in the name of the municipality):

…….

Area	Very satisfied	satisfied	Rather satisfied	unsatisfied	Very unsatisfied
Culture	☐	☐	☐	☐	☐
Shopping opportunities	☐	☐	☐	☐	☐
Children's playgrounds	☐	☐	☐	☐	☐
Recreational natural areas	☐	☐	☐	☐	☐
Transport services	☐	☐	☐	☐	☐
Job opportunities	☐	☐	☐	☐	☐
Health care	☐	☐	☐	☐	☐
Environmental pollution	☐	☐	☐	☐	☐



On the scale of 1 to 10 circle how much you have participated in the game and the work with the worksheets:

least 1 2 3 4 5 6 7 8 9 10 most