Bodies and substances
Recommended grade: 6.
Purpose of activity: Division of materials into bodies and substances
Target language: *body*, *substance*
Aids: cue-cards, bag or top hat, worksheet, coloured pencils
Time allowed: 15–20 minutes

- We prepare two sheet of large-format paper.
- On one we write the word *SUBSTANCES* and on the other, the word *BODES*. We explain the meaning of both words by providing first examples of "substances" while holding up the sheet of paper with the word *SUBSTANCES* and then examples of "bodies."
- We ask the students in they understand us and know what the words means in Czech: *"Do you understand? What is a substance / a body is in Czech?"*

Note: Students may be surprised by the new meaning of the word "*body"*, since up to the present they have encountered it only in the context of the human body.

- We place both signs in the class at a suitable distance from each other.
- Smaller cards contain the words of individual substances and bodies, e.g. *plastic, paper*, *wood*, *glass*, *water*, *spoon*, *knife*, *ball*, *yo-yo*. We distribute the cards to the students; they may draw them from the bag or top hat. Each student should have one card. Pairs are also admissible.
- We ask the students to stand next to either *BODIES* or *SUBSTANCES*, according to what they have written on their card: *"if you have something you think is a body, go to the BODIES end of the classroom. If you have something you think is a substance, go to the SUBSTANCES end of the classroom."*
- When the students are divided into two groups, we check to see that they are standing in the right spot. Each student will show the others the word on his/her card; he/she will read it and answer in a complete sentence. For example: *"Glass is a substance."* The others repeat the sentence in chorus.
- Then the students return to their seats, where they complete the assignment on the worksheet.
- Students work independentaly and lastly we check the answers together. The students shall correct the mistakes on the worksheet in colour.

Classroom language:

"Do you understand?	Rozumíte?
What is a substance / a body in Czech?"	What does a *substance/ a body* mean in Czech?
Please, if you've got something you think is a body, go to the BODIES end of the classroom.	Prosím, jestliže máte něco, co si myslíte, že je těleso, běžte k *BODIES*.
If you've got something you think is a substance, go to the SUBSTANCES end of the classroom.	Jestliže máte něco, co si myslíte, že je látka, běžte k *SUBSTANCES*.
Glass is a substance.	Sklo je látka.
A ball is a body.	Míč je těleso.

What sinks, what floats?
Recommended grade: 6.
Purpose of activity: Determination of which objects sink and which float on the surface
Target language: *Float*, *sink*
Aids: Experimental materials, chart, transparent container, water, physics tables
Time allowed: 15 minutes

- We prepare the equipment for the experiment that will determine which objects float on the surface and which do not. We can use the examples in the chart or create our own.
- We must not forget the transparent container filled with water so the students can see the respective body.
- We show the class the first body that we are going to place in the container, we ask the students to identify it in English: *"What's this?"*
- We ask whether they think the object will float or sink to the bottom: *"When you put it in water do you think it will float or sink?"*
- Those that think it will float, will stand, those that think it will sink, shall remain seated: *"If you think it will float, stand up. If you think it will sink, remain seated."*
- We record the number of students in the column accordingly. We verify our theory using an experiment and again ask the same question: *"When you put it in water did it float or sink?"* Students answer. *"It floated. / It sank."*
- Lastly, based on the experiments with bodies, we jointly summarize our findings, i.e. which objects sink and which float and why. The students find the densities of individual substances specified in the chart and compare them with the density of water. What can we conclude from the data?

Conductors and insulators
Recommended grade: 6.
Purpose of activity: Determination whether a certain object is an insulator or a conductor
Target language: *Conductor*, *insulator*, *conduction of electricity*
Aids: Boxes or bags, daily necessities
Time allowed: 10 minutes

- We prepare a fairly large box or bag to hold various daily necessities, e.g. a length of wire, a plastic spoon, a piece of paper, aluminium foil, a CD, a pair of scissors, an elastic band, straw, a key and a piece of wood.

Note: If we find that the students are unable to name certain objects in English, we first examine them and name them together.

- We divide the students into two or more teams competing with one other.
- Each time we call on the team leader to take an object out of the box, to name it in English, and tell us if it is a conductor or an insulator (the students may guess the objects before they take it out of the box by simple touch). *"Take out an object. What is it? Is it a conductor or an insulator?"*
- If a student answers correctly, his team gains a point.
- In this manner, the teams take turns. It is best if all the members of individual teams also take turns.
- In conclusion, we summarize which materials conduct electricity, which do not, and what they are important for: *"What materials conduct electricity? What materials don´t conduct electricity? Why are insulators important?"*

Note: We can switch into the mother tongue.

Classroom language:

"Take out an object. What is it?	Vyjměte jeden předmět. Co je to?
Is it a conductor or an insulator?	Je to vodič, nebo izolant?
What materials conduct electricity?	Jaké materiály vedou elektřinu?
What materials do not conduct electricity?	Jaké materiály nevedou elektřinu?
Why are insulators important?	Proč jsou izolanty důležité?

Testing supermarket bags

Recommended grade: 6.–7.
Purpose of activity: Determination of which supermarket has the best plastic bags
Target language: Comparison of adjectives
Cross-disciplinary topic: Environmental studies (supplementary activity 2)
Aids: Bags from various stores, PET bottles filled with water, worksheet with chart and graph, scale, internet resource
Time allowed: 20 minutes

- We ask the students in advance to bring plastic bags from various supermarkets and other stores, we also bring some of our own.
- We explain to them that we will test which bag withstands the greatest weight.
- We collect the bags from several retailers during the class; we write their names on the blackboard and the students guess which bag is the most durable.
- As weight we use, e.g. 1.5 L PET bottles filled with water. The students may also try to guess how many bottles a given bag will bear.
- During the test we always write the number of bottles that bag held before it tears. We must not forget to record the name of the retailer.
- Lastly, we compare the individual bags and determine which one has the best quality, or the retailer with the best quality shopping bags, resp.

Classroom language:

Please, bring in some plastic supermarket bags for the next lesson.	Prosím, na příští hodinu přineste igelitové tašky z různých supermarketů.
We are going to test them to find out which shop has the strongest bags.	Budeme je testovat, abychom zjistili, který obchod má nejpevnější tašky.
Which bag is the best? What do you think?	Která taška je nejlepší? Co myslíte?
How many bottles can it hold?	Kolik lahví unese?
Count the number of bottles you can put into a plastic bag until it breaks.	Počítejte lahve, které taška unese, než se zničí.
Write down the number of bottles each plastic bag can hold.	Zapište počet lahví, které každá igelitová taška pobere.

Supplementary activity 1:
If we wish to determine how much weight individual bags carried in kg, we weigh a single PET bottle and multiply the weight of one bottle by the total number in the bag. To secure an accurate calculation, each bottle must contain an identical quantity of water (they must weight the same).

Supplementary activity 2:
How can plastic bags be recycled?
We can ask the students to answer this question as homework; they can use the internet as a source (e.g. a high qualtiy paddock for horses can be made from plastic bags).

And what I can I do myself to contribute?
Let us think of ways of limiting excessive use of plastics bags. E.g. by reusing shopping bags we can save energy and avoid waste. In stores, we need not always

take disposable bags. We will sort the bags because during disposal they release primarily carbon dioxide (CO_2) and methane (CH_4), which pollute air, ground water, and the soil.
More information is available at:
http://ec.europa.eu/environment/climat/campaign/control/recycle_cs.htm,
http://detem.mzp.cz/.

Under pressure
Recommended grade: 7.
Purpose of activity: Calculation of the weight and pressure of a bare foot on the floor
Target language: *Weight*, *pressure*, *kg*, *N*, *cm*^{2}, *m*^{2}
Cross-curricular relationships: Mathematics, natural science
Aids: Personal scale, millimeter paper, pencil, worksheet, internet resource
Time allowed: 15–20 minutes

- We bring a personal scale into the class and if possible more than one, so that the weighing is faster.
- Each student determines his/her current weight, followed by the force of gravity, and he/she writes the values in the worksheet.
- Then the students determine the force which a foot exerts on the floor.
- The students then subsequently trace their foot on millimetre paper, calculate the approximate area of their foot in cm^2 and convert it into m^2.
- They determine the pressure which a bare foot applies to the floor.
- The next part of the force of gravity and pressure calculations relates to an elephant.
- The final task is that of students calculating how many students it takes to exert the same pressure on the floor as does an elephant.

Classroom language:

Weigh yourselves. How much do you weigh?	Zvažte se. Kolik vážíte?
Calculate your weight in Newtons.	Vypočítejte svou tíhu v newtonech.
Write it down in your worksheet.	Zapište to do svého pracovního listu.
Calculate the force your foot exerts on the floor.	Vypočítejte sílu, kterou vaše noha působí na podlahu.
Draw / trace around your foot on the squared paper.	Obkreslete své chodidlo na čtverečkovaný papír.
What is the surface area?	Jaká je to plocha?
Calculate the pressure of a bare foot on the floor.	Vypočítejte tlak bosé nohy na podlahu.
How much does an elephant weigh?	Kolik váží slon?
Calculate the force an elephant's foot exerts on the floor.	Vypočítejte sílu, kterou sloní noha působí na podlahu.
Calculate the pressure of the elephant's foot on the floor.	Vypočítejte tlak nohy slona na podlahu.
How many students does it take to create the same amount of pressure on the floor as an elephant?	Kolik je potřeba studentů na to, aby vynaložili stejný tlak na podlahu jako slon?

Supplementary activity:
The students can calculate the weight and pressure of the feet of other animals, e.g. cats, cows. Determine the weights of individual animals and their feet sizes at:
http://www.factsaboutanimals.net/amazing-animal-facts.htm,
http://kids.nationalgeographic.com/Animals/CreatureFeature,
http://openlearn.open.ac.uk/mod/resource/view.php?id=163525.

How much does your school bag weigh?
Recommended grade: 6.-7.
Purpose of activity: Determination the weight of the school bags the students take into class
Target language: Numerals, comparing
Cross-curricular relationships: Mathematics, civics
Aids: Scale, blackboard
Time allowed: 20 minutes

A piece of information, to begin with. Doctors say that it is not healthy for a student to carry more than 10% of his/her weight in a backpack.

- We shall discover how the students in our class measure up.
- We shall make a chart according to the scheme (we enlarge the copy sufficiently or draw it on a large sheet of paper) and fasten it to the blackboard/bulletin board. All the students in the class shall weigh themselves and calculate 10% of the their weight. They shall write the data against their names in the chart.
- Next, everyone will weight their bag and again write the data next to their name in the chart.
- We shall circle the backpacks that are overweight, and calculate how many students carry overweight backpacks.
- We shall compare the backpack weights of individual students, we look for the heaviest and the lightest: *"Whose backpack is the heaviest / the lightest?"* We can ask students what they are carrying in their bags to make them heavier than others: *"What have you got in your backpack that it is so heavy?"*
- It is also possible to discuss how to remove the problem: *"How can you remove the problem?"*

The world around us

Recommended grade: 7.
Purpose of activity: Provision of the correct answer to the question concerning gases
Target language: *Solid*, *liquid*, *gas*, *fuel*, *oxygen*, *helium*, *carbon dioxide*, *flammable*, *evaporation*, *freezing*, *melting*, *boiling*, *condensing*
Cross-curricular relationships: Chemistry
Aids: Worksheet with questions and answers
Time allowed: 15 minutes

- We cut the questions and answers into strips and distribute them randomly to the students.
- The students walk round the class with questions and try to find the correct answers to them. We can set a time limit (e.g. five minutes), during which they must find the correct answer.
- When jointly checking the answers, we ask the students to explain their answers in detail, they may switch to their mother tongue.

Classroom language:

Find the correct answer to your question.	Ke své otázce najděte správnou odpověď.
You have 5 minutes to finish it.	Máte na to 5 minut.

Correct answers:

1. *What state of matter can be easily compressed?*	*gas*
2. *What states of matter can flow?*	*liquids, gases*
3. *What states of matter take the shape of the container?*	*liquids and gases*
4. *What state of matter can we smell?*	*gases*
5. *Which gas is an important fuel?*	*natural gas*
6. *Which gas is needed for breathing?*	*oxygen*
7. *Name the light non-flammable gas often used in balloons.*	*helium*
8. *Which gas produces the fizz in lemonade?*	*carbon dioxide*
9. *What process do we call evaporation?*	*liquid → gas*
10. *What conditions are best for drying?*	*warm air with a fan*
11. *What process do we call condensation?*	*gas → liquid*
12. *What states of matter can´t we smell?*	*solids and liquids*

How much light passes through different materials?

Recommended grade: 7.

Purpose of activity: Determination of the amount of much light passing through certain materials

Target language: *It allows light through clearly / it allows some light through, but not clearly* / *it does not allow light through at all*

Aids: Cards, blackboard, flashlight, ball, toilet paper, carton paper, aluminium foil, cellophane, transparent paper, wall paper, glass, cotton, photographs

Time allowed: 15 minutes

- We attach the cards with words on the blackboard blank face up. There are three words on every line and in every column.
- The students form two teams, *Noughts* (0) and *Crosses* (X).
- The teams take turns to throw a soft ball at the cards placed on the blackboard. We turn the card they hit and read the statement: *"(Aluminium foil) lets light through clearly. (Aluminium foil) lets some light through, but not clearly. (Aluminium foil) does not let light through at all."*
- When the team selects the correct statement, we take the card and draw the sign of the given team (0/X). When they choose the incorrect statement, the other team gets a chance. If neither team answers correctly, we turn the card over and place it back in the same position.
- We verify the results by immediately performing an experiment. We use the flashlight to shine through the given material.
- The object of the game is to have three symbols (O/X) either horizontally, vertically, or diagonally (similar to tick-tack-toe).

Classroom language:

Throw the ball at the cards.	Házejte míčkem na karty.
(Aluminium foil) lets light through clearly.	Hliníková fólie propouští jasné světlo.
(Aluminium foil) lets some light through, but not clearly.	Hliníková fólie propouští trochu světla, nejasné.
(Aluminium foil) does not let light through at all.	Hliníková fólie nepropouští žádné světlo.

Supplementary activity:

Students fill the missing words into the text.

Some materials allow light to travel through them clearly.	
These materials are called _____ materials.	*TRANSPARENT*
Some materials allow some light to travel through them, but the light is blurred.	
These materials are called _____ materials.	*TRANSLUCENT*
Some materials don't allow light to travel through them at all.	
These materials are called _____ materials.	*OPAQUE*

Note: We can bring the students' attention to verbs and verbal relationships that describe these events (*let light through* = *allow light to travel through*).

Simple machines

Recommended grade: 8.

Purpose of activity: Naming of devices and determination of which group of simple machines they belong to

Target language: *Lever*, *inclined plane*, *wheel and axle*, *pulley*

Aids: Cue cards with pictures and words, blackboard, table

Time allowed: 10 minutes

- We first copy and cut cards with illustrations and descriptions of simple machines. We write the names of four basic simple machines on the blackboard. *LEVERS*, *INCLINED PLANES*, *WHEELS AND AXLES*, *PULLEYS*.
- By way of introduction we can try to define for students what simple machines are: *"A simple machine is any device making our life easier or more efficient. It may make something easier to move, change the direction of an object and so on. The four simple machines are a lever (e.g. hammer, seesaw), an inclined plane (e.g. ramp, wedge), a wheel and an axle (e.g. door knob), pulley (e.g. block and tackle)."*
- We spread out the cards on the table, face down.
- We call on a student to take a card and to demonstrate how the machine works/operates using mimics. The others in the class must name the devices and determine which group of simple machines they belong to.
- Lastly, we place the device in the correct group on the blackboard.

Classroom language:

Please, come here, and pick up one card.	Prosím, pojď sem a vyber jednu kartu.
Demonstrate how the machine is used.	Předveď, jak se stroj používá.
Decide where it goes.	Rozhodni, kam patří.
Does it go under levers, inclined planes, wheels and axles, or pulleys?	Patří pod páky, nakloněné roviny, kola na hřídeli, nebo kladky?

Identification of correct definitions

Recommended grade: 7.–9.
Purpose of activity: Matching of a correct definition of an expression
Target language: *Atom*, *computer*, *experiment*, *gas*, *helium*, *ice*, *liquid*, *molecule*, *plasma*, *solid*
Cross-curricular relationships: Chemistry
Aids: Cue cards with words and definition, a box or a top hat
Time allowed: 10–15 minutes

- Write words on the cards and their definitions on strips of paper.
- Each student shall draw a card with a word or a strip of paper with a definition from the box or top hat and "spread out" across the class.
- Their task is that of matching the words and definitions; the students form pairs. They must always read what is written on their paper and decide if they can form a pair (see below).
- We let the students search as long as we consider appropriate.

Note: We can broaden and update the words and definitions as needed.

Correct answers:

atom	*the smallest part of a chemical element*
computer	*an electronic machine that can store, find and organise information*
experiment	*a scientific test*
gas	*any substance like air*
helium	*a very light gas that does not burn, often used to fill balloons*
ice	*water that has frozen and become solid*
liquid	*a substance that flows freely like water*
molecule	*the smallest unit, consisting of a group of atoms*
plasma	*a gas that is present in the sun and most stars*
solid	*a hard or firm substance, which is not in the form of a liquid or gas*

Pushing or pulling?
Recommended grade: 8.
Purpose of activity: Division of objects according to their ability to be pushed, pulled, or both
Target language: *Push*, *pull*
Aids: Bottle, cue cards with words
Time allowed: 10 minutes

- We write the names of various objects on the cards that can be pushed, pulled, or both (the attached cards with words can also be copied and cut).
- Have the students sit in a circle: *"Please, sit in a circle."*
- We place a bottle and stack of cards with words, face down in centre of the circle.
- We spin the bottle. When the bottle stops spinning, the student the neck of the bottle points to draws a card from the pile, reads the word that is written on the card, and states whether the given object can be pulled, pushed, or both: *"This is a (door). I/We can pull it / push it / pull it and push it."*
- If the bottle points to a space between two students, they can play paper, rock, scissors to decide who continues in the game.
- When the student answers correctly, he/she gains a point and spins the bottle: *"Spin the bottle, please."* If he/she answers incorrectly, the student to his/her left shall have a turn.
- We repeat the procedure for the remaining words.

Alternative for more advanced students:
We practise the verbal form in the passive tense; *the (door)* ***can be*** *push****ed*** *and pull****ed****.*

Classroom language:

Please, sit in a circle.	Prosím, sedněte si do kruhu.
What is this? / What is it?	Co je to?
This is a door.	To jsou dveře.
I/We can pull it and push it.	Můžu/Můžeme je táhnout i tlačit.
I/We can pull it / push it.	Můžu/Můžeme to táhnout/tlačit.
Spin the bottle, please.	Roztoč lahev, prosím.

Story of wind
Recommended grade: 8.
Purpose of activity: Working with text to learn the background of the story of the part played by wind in nature.
Target language: General
Cross-curricular relationships: Geography, natural science
Aids: Worksheet (story with assignments)
Time allowed: 45 minutes

- We give the students time to read the story and to complete task A. They must arrange the sentences in correct order.
- In exercise B, the students decide if the statement is true or false.
- They must then complete the sentences.
- The final task is that of telling the story and explaining what happens if the wind on shore drops.

Correct answers:

A:
1 *One day, Wendy's father gave her a new wizard hat.*
2 *The wind blew Wendy's beautiful hat away.*
3 *Wendy wanted her father to stop the wind permanently.*
4 *The next morning when Wendy woke up, it was cold and dark.*
5 *To stop the wind, Wendy's father had to send the sun away.*
6 *Wendy then understood that she must respect all of nature's forces.*

B: *1F, 2F, 3T, 4F, 5F, 6T, 7F, 8T*

C:
The sun makes the wind.
The sun warms the land and the air above the land rises.
The cool air over the ocean moves in to take its place.
To stop the wind, I had to send the sun away.

Supplementary activity:
The students draw Wendy and her father the wizard, and the place where they live as they imagine them. How it looked when there was wind, followed by calm.

Interview with an electric light bulb
Recommended grade: 8.
Purpose of activity: Discussion between a reporter and an electric lightbulb
Target language: See worksheet
Aids: Worksheet
Time allowed: 15 minutes

- The students form pairs.
- One of the pair will represent an electric light bulb and the other the reporter/moderator conducting the interveiw. If there is difficulty in deciding who shall represent whom, the students shall decide by playing “paper, rock, scissors.”
- The reporter/moderator has written questions he/she wishes to ask the light bulb on his/her notepad (i.e. worksheet).
- While the students conduct the interview, we walk among them and help them.
- The students then exchange the roles in pairs.

Classroom language:

One of you is an electric light bulb,	Jeden z vás je elektrická žárovka,
the other one is a journalist/reporter.	druhý je novinář/reportér.
Play “ paper, rock, scissors.“	Zahrajte si „kámen, nůžky, papír.“
Conduct an interview with the light bulb.	Udělejte rozhovor s žárovkou.
Swap roles, please.	Vyměňte si role, prosím.

Electricity – Bingo

Recommended grade: 8.

Purpose of activity: Repetition of various words from the chapter, using the game Bingo relating to electricity

Target language: *Light bulb*, *microwave oven*, *coil*, *power station*, *vacuum cleaner*, *battery*, *resistor*, *electric circuit*, *wire*

Aids: Bingo cards, bag

Time allowed: 10–15 minutes

- We cut the worksheet into small cue cards with words and place them in the bag.
- The students play in groups. Each receives a Bingo card with 3 x 3 squares that contain illustration of the words we have in the bag.
- We pull the first cuecard from the bag and read it aloud. If one of the students has an illustration on his/her Bingo card corresponding to the word, he/she must cross it out.
- We pull out one word after another and the students progressively cross them out.
- The group that crosses out all of the pictures on their Bingo card first, wins.

Types of energy
Recommended grade: 8.
Purpose of activity: Writing down in the time allowed, the greatest number of things related to the energy source actuated by four types of energy.
Target language: *Manpower*, *wind*, *electricity*, *chemicals*
Aids: Blackboard, sheet of paper
Time allowed: 10–15 minutes

- We divide the students into groups.
- We write the question *WHAT MAKES IT MOVE?* on the blackboard and underneath the words *Manpower, Wind, Electricity, and Chemicals*.
- We list several examples of objects that are driven, e.g. *car – chemicals*. We ask the students: *"What makes a car move?"* The answer is: *"Chemicals make a car move."* We can ask differently: *"What do chemicals make move?"* Answer: *"A Car/Cars" / "Chemicals make a car/cars move."*
- When we are certain that the students understand, they shall take a sheet of A4 paper and fold it into quarters. They shall copy the words from the table (see below) into the frames created.
- The students in the groups must write during the time limit allowed, the largest number of things moving directly actuated by this source.
- After the specified period has elpased, we check our answers alongside the other groups. The group with the greatest number of correct answers wins.

Manpower	**Wind**
skis scissors pen hammer pram bike skateboard	wind mill kite yacht paraglider hot-air balloon
Electricity	**Chemicals**
drill train hair dryer TV CD player lamp	car motorbike plane helicopter spaceship hot-air balloon

Work, energy and speed – a board game

Recommended grade: 8.
Purpose of activity: Implementation of simple tasks using a board game
Target language: See questions
Cross-curricular relationships: Mathematics
Aids: Dice, cards with tasks, coloured paper
Time allowed: 15–20 minutes

- We make a board game on the floor using the paper cards; we arrange the cards, e.g. alongside each other in the shape of a snake.
- We divide the students into several groups. Each group shall represent a player.
- Tasks the students must solve during the game are assigned on the cards.
- We stack green cards randomly in the deck implying that if the student stands on them, he/she may throw the dice once more: *"Have another turn."* Red cards mean that if a student stands on them, they shall go back to the beginning: *"Go back to the beginning."*
- We can insert other coloured cards meaning a group shall advance a certain number of squares. The instructor decides.
- The first group tosses a dice and according to the number which appears, advances to the given card: *"Take (3) steps forward*. *What's the question?"* They complete the task jointly (we set a time limit for finding the solution). If they fail to complete the task, or the answer is wrong, the group goes back to their original place: *"Go back to where you started from. / Go back (3) steps."*
- The first group to reach the goal, wins.

Note: Students may use a calculator. We modify the tasks to match the students' abilities. We do not have to use all the questions in a single game.

Classroom language:

These are special cards.	Tohle jsou speciální karty.
The green card means have another turn.	Zelená karta znamená, že můžete hodit ještě jednou.
The red card means go back to the beginning.	Červená karta znamená, že se musíte vrátit na začátek.
Take (3) steps forward.	Běž o (3) kroky/políčka/karty dopředu.
What's the question?	Jak zní otázka?
Go back to where you started from. / Go back (3) steps.	Vrať se tam, odkud jsi začal/a / jdi zpět o (3) kroky.

Correction solution:

1. *It takes energy to do work*
2. *60 J*
3. *400 J*
4. *750 J*
5. *1,764 J*
6. *98,000 J*
7. *100 W*
8. *200,000 W*

9. *100,000 W*
10. *504 W*
11. *40 m/s*
12. *8 m/s*
13. *10 m/s*
14. *125 m/s*
15. *4 h*
16. *3 s*
17. *660 km, 7 h, 94.3 km/h*
18. *27.8 m/s*
19. *36 km/h*

Physics terms – a semi-crossword puzzle
Recommended grade: 8.–9.
Purpose of activity: Insertion of the missing words into the crossword puzzle
Target language: See crossword puzzle words
Aids: Worksheet with crossword puzzle
Time allowed: 15 minutes

- A pair of students receives a half-completed crossword puzzle, but each of has a different completed half.
- The students take turns in pairs to define the words in their crossword puzzle; the partner shall always fill in the missing word in his/her crossword puzzle. We ensure that the students do not look into their neighbour's crossword puzzle and that they do not simply copy the given words.
- After completing all the squares, both of them shall have an identical crossword puzzle.

Classroom language:

What is 1 down?	Co je 1 dolů?
What is 5 across?	Co je 5 vodorovně?

Definitions of words in the crossword puzzle:
STUDENT A
5 across - A negatively charged ion.
9 across - A common temperature scale.
3 down - The scientific study of sound.
4 down - An instrument for measuring temperature.
6 down - A positively charged ion.

STUDENT B
7 across - A positive electrode.
10 across - An instrument for measuring atmospheric pressure.
1 down - A negative electrode.
2 down - A non-conductor of sound, heat or electricity.
8 down - Reflected sound.

Where does their electricity come from? A riddle
Recommended grade: 8.–9.
Purpose of the activity: Determination based on information provided, type of energy used by each city
Target language: *Electricity*, *nuclear power*, *fossil fuel*, *renewable energy*
Aids: Worksheet, clues
Time allowed: 10 minutes

- We provide a copy of the riddle to pairs or groups of students.
- The students' tasks is to determine using the clues, which city uses wind for the production of electricity: *"Try to work out which town uses wind farms to make electricity using the following clues."*

Norwich gets its electricity from falling water.
Swindon does not use nuclear power.
Exford uses a fossil fuel to make electricity.
Bexhill does not use a renewable energy source to make electricity.

Correction solution:
Swindon – Wind farms
Bexhill – Nuclear
Exford – Coal
Norwich – Hydropower

Solar system
Recommended grade: 9.
Purpose of activity: Naming and definition of planets in the solar system
Target language: Planets in the solar system
Cross-curricular relationships: Geography, natural science
Aids: Diagram, worksheet, pictures of planets
Time allowed: 20 minutes

- Before we begin the exercise, we repeat mechanically the names of planets and their correct pronunciation with the students.
- The students shall divide into three to four teams.
- Each team shall receive a diagram on a sheet of paper similar to the one of the worksheet. We shall simultaneously prepare a set of pictures of the planets for each team.

Note: Pictures of the planets can be found, e.g. at:
http://solarsystem.nasa.gov/planets/index.cfm,
http://pages.prodigy.net/fiterman/space/planetarium.htm.

- We adjust the size of the pictures of the planets to the diagram, in which the students shall place the planets according to instructions. We shall spread out the set of pictures for all teams in one place where the students shall come and receive them.
- Next, we slowly read the information about individual palents (see worksheet). The team shall always send their representative to find the correct picture of the planet among and bring it back. The students in the team then place it in an appropriate area of the diagram and enter its name.
- When all the planets have been placed, we place the diagrams on the blackboard, or on the floor. We then compare, check, or correct them.
- Lastly, we give each student a worksheet with a diagram in which he/she fills in the correct name of each planet. He/she checks the answers according to the large diagram.

Classroom language:

This is the Sun/Mercury/…	Toto je Slunce/Merkur/…
Say it with me:	Říkejte se mnou:
Listen to me and place the planet in the right orbit in the diagram.	Poslouchejte mě a umístěte planetu na správnou oběžnou dráhu v diagramu.
Please, label the planets in the diagram.	Prosím, napište názvy planet do diagramu.

Definitions

Sun – The Sun is the star at the center of our solar system.

Mercury – Mercury is the planet closest to the Sun.

Venus – Venus is the second planet from the Sun. It is the hottest planet.

Earth – Earth is the third planet from the Sun and is the planet we live on.

Mars – Mars is a red planet and the fourth planet from the Sun.

Jupiter – Jupiter is the fifth planet from the Sun. This gas giant is the largest planet in our Solar system.

Saturn – Saturn is the sixth planet from the Sun. This gas giant has large, beautiful rings.

Uranus – Uranus is a gas giant and is the seventh planet from the Sun.

Neptune – Neptune is a gas giant and is the eighth planet from the Sun.

Pluto – Pluto is a dwarf planet that is the farthest planet from the Sun. It is smaller than other 8 planets.

Note: Pluto was reclassified in 2006 by the International Astronomical Union from being a planet, into the group of so-called “dwarf planets.” The solar system accordingly contains only eigth planets. Detailed information is available on http://www.asu.cas.cz/~stork/cz/noviny/pluto/.

Colours and light

Recommended grade: 9.

Purpose of activity: Determination of the ability of certain colours to absorb more sunlight than others

Target language: *Absorb*, *sunlight*, *colour*; comparisons

Aids: Water, food colours, four tall transparent glasses, thermometer

Time allowed: 15 minutes

- The aim is to determine if certain colours absorb more sunlight than others: *"Do some colours absorb more sunlight than others?"*
- We ask the students who think that all colours absorb the same amount of sunlight to raise their hands: *"Please put your hands up if you think that all colours absorb the same amount of sunlight."*
- Those, who did not raise their hands therefore believe the statement to be false; we therefore ask: *"Why do you think that some colours absorb more sunlight than others?"*
- We verify our hypotheses using an experiment peformed together with the class; it may also be performed individually by students in groups.
- We fill the glass with cold water. We record the temperature of the water in the chart.
- We add 20 drops of red food colour to one glass, to the second glass we add 20 drops of yellow colour, to the third one 20 drops of blue colour and nothing to the fourth glass.
- We place the glasses in direct sunlight for 15 minutes.
- We then measure again and record the water temperature in all four glasses.
- Did the temperature of the water change? Which water is warmest? What did we learn about colour and light?

Classroom language:

Fill the glasses with cold water.	Naplňte sklenice studenou vodou.
Record the temperature of the water in all four glasses.	Zapište teplotu vody ve všech čtyřech sklenicích.
Add 20 drops of red colour.	Přidejte 20 kapek červené barvy.
Place the glasses in a sunny place for 15 minutes.	Dejte sklenice na 15 minut na slunné místo.
Did the temperature of the water change?	Změnila se teplota vody?
Which glass of water got the warmest?	Která sklenice vody je nejteplejší?
What did you learn about colour and light?	Co jste se dověděli o barvě a světle?

Electricity – safety considerations
Recommended grade: 9.
Purpose of activity: Definition of the rules of behaviour on exposure to electricity
Target language: Imperative; safety principles when working with electricity
Aids: illustrations
Time allowed: 10–15 minutes

- We enlarge the illustrations with characters in various situations so that the entire class can see them, or we provide copies to pairs or groups of students, as necessary.
- The students shall carefully review the individual figures and their behaviours and tell us what they are doing wrong: *"Look at the cartoon characters to find out what they are doing wrong."*

Examples of correct answers:
Never fly a kite near any kind of overhead wires!
Lamps can get very hot! Never place anything near or inside a lamp shade.
Never plug anything into an electrical outlet without checking with your parents or an adult first.
Do not place heavy objects on top of power cables.
Electricity and water do not mix!
Do not place anything metallic inside a toaster or any other electrical appliance.
Don't pull a toy by its power cable or plug in a toy whose power cable appears damaged.

Can we exist without them?
Recommended grade: 6.–9.
Purpose of activity: Discussion of human inventions
Target language: *Can/cannot*, *like / dislike*, *need*, *use*
Aids: Cards with inventions, a top hot or bag
Time allowed: 15 minutes

- Each student shall draw a card from the top hat or bag; written on the card is the name of an invented object (see cards to be cut up; we may add or exchange them for others at our discretion).
- The students provide ther individual opinions about the invention. They shall specifically state whether or not they find it useful, if they could exist without it, if they would instead prefer to get rid of it entirely, etc. They shall dequately justify their opinions.
- A classroom discussion may then follow about the given invention, who agrees, who does not, and why.

Classroom language:

Take a card out of the bag/hat.	Vezměte si z tašky/klobouku kartičku.
Do you think it's useful/useless?	Myslíš si, že je to užitečné/zbytečné?
What do you use it for?	Na co to používáš?
How often do you use it?	Jak často to používáš?
Who usually needs it?	Kdo to obvykle potřebuje?
Why do you like / don´t you like it?	Proč se ti to líbí/nelíbí?
Could you live without it?	Mohl/Mohla bys bez toho žít?
Would you throw it away? Why?	Zbavil/a by ses toho? Proč?
Do you agree/disagree?	Souhlasíte/nesouhlasíte?
What do YOU think?	Co si myslíš TY?

Note: More inventions arranged alphabetically and information about them can be found at: http://inventors.about.com/od/astartinventions/a/FamousInvention.htm, http://www.indianchild.com/inventions.htm.

What / who am I?
Recommended grade: 6.–9.
Purpose of activity: Determination using questions, of who or what I am
Target language: Simple present tense, simple past tense
Aids: Cue-cards with names of famous physicists and inventions
Time allowed: Decided by instructor

- We enter names of famous physicists and inventions on paper cards and scatter them on a table face-side down.
- We call on one of the students (volunteer or decided by a draw) to show a card. We stick it on his back. The student does not know what is on his/her back, but the others do.
- The player in this game shall be a person or object named on his/her back. The task is to determine who or what he/she is. He/she asks the others and they are only allowed to answer YES/NO.
- The student with the card on his/her back asks: "Am I a person?" Did I live in the 19th century? Am I a thing? Whas I invented by Edison? The name of the person or object may only be discovered by asking the following type of question: "Am I A. Einstein? Am I a light-bulb?"

Note: The students must first have basic knowledge of the scientists, before the game can begin.

- The game shall have a time limit. The students may only ask until the time limit expires, e.g. for three minutes.
- If the player fails to discover the name on the card before the time is up, he/she loses. We disclose the name on the card (physicist, invention) to the student.

Classroom language:

Please, come here and point at a card.	Prosím, pojď sem a ukaž na kartu.
Find out who or what you are.	Zjisti, kdo nebo co jsi.
Ask questions.	Dávej otázky.
You can answer only Yes or No.	Můžeš odpovídat pouze Ano nebo Ne.
You've got three minutes.	Máš tři minuty.
Am I a man/woman/thing?	Jsem muž/žena/věc?
Am I famous?	Jsem slavný/á?
Did I live in the …… century?	Žil/a jsem v …… století?
Did I live and work in (Germany)?	Pracoval/a jsem a žil/a v (Německu)?
Did I invent a ……?	Vynalezl/a jsem ……?
Am I a light bulb?	Jsem žárovka?

Version 1:
We prepare the names of physicists/scients and inventions on the paper cards so that each player has one card.

We then fasten the piece of paper on the person's back, so that only the others see it. The player in this game shall be a person or object that is named on his/her back. All of the players must determine who they actually are. The players walk around the classroom and ask around; however, the students may only answer YES/NO. Each

student may only ask the other competitor once. He/she must ask someone else if the answer is incorrect. The competition shall have a time limit. Who student who discovers “himself/herself” first, wins. The other competitors play until the time limit expires, e.g. 20 minutes. The players who fail to discover their identity and use up all of their guesses, lose.

Version 2:
We shall prepare the cards with names of several physicists/scientists and inventions, and spread them out across the table. To make the game more interesting, we can add a small portrait of a given scientist, which we can find, for example on: http://www.crystalinks.com/scientists.html. The student chooses one of the scientists or inventions, but the others must not know who/what it is. The questions posed must determine who are what the scientist/invention is.

Supplementary exercise:
The students shall fill in forms of the verbs in the following text in the frames in the simple past tense.

Coded words

Recommended grade: 6.–9.

Purpose of activity: Rearrangement of the letters in the word in the correct order so that the word makes sense

Target language: *Atom*, *experiment*, *gas*, *helium*, *ice*, *liquid*, *molekule, diffusion*, *solid*, *water*

Cross-curricular relationships: Chemistry

Aids: Cards with letters

Time allowed: 10 minutes

- On individual cards prepared in advance we write the letters of words that the students will rearrange, e.g. for the word *SOLID*, we need five cards *(S, O, L, I, D)*. Should the students compete in teams, we must provide a deck of identical cards for each team.
- Before we give the team the cards with letters, we mix them thoroughly. Each student shall receive a letter. Others members of the team may help.
- The students must stand according to the order of the decoded word.
- The team which composes the correct word first, wins and gains a point.
- We proceed in the same manner for the other words.

Note: If we wish to give the task to the students in the form of a class task, we can use the following worksheet; the words at the end of the column being the correct solutions.

Solid, liquid, and gaseous state of matter
Recommended grade: 6.
Purpose of activity: Division of compounds into solids, liquid, and gases
Target language: *Solid/liquid/gas state of matter*
Cross-curricular relationships: Chemistry
Aids: Cards with words, worksheet
Time allowed: 15 to 20 minutes

- We use the same procedure in this exericise tused in the exercise of **Bodies and substances.**
- This time we prepare two sheet of large format paper. On one sheet we write SOLIDS, on the second LIQUIDS, and on the third, GASES. We explain the meaning of the three terms by providing examples of solids, followed by liquids and by gases. We ask the students what the words means in Czech: *„What is a solid, liquid and gas in Czech?“* (Note: Out of curiosity, we can notify the students about the other meaning of the word *solid*, i.e. firm, unyielding).
- We place the three signs in the class at a suitable distance from each other.
- On smaller, individual cards we write solids, liquids, gases (we can use the same cards that we prepared for the exercise **Bodies and substances**). We distribute them to the students (that may draw them from a bag or top hat). Each student should have one card, or pair as necessary.
- We ask the students to go to the sign SOLIDS, LIQUIDS, or GASES according to what they have written on their card: "*If you have a solid, go to the SOLIDS. If you have a liquid, go to the LIQUIDS. If you have a gas, go to the GASES.“*
- When the students are divided into two groups, we check to see that they are standing in the right places. Each student shall show the others the word on his/her card; he/she will read it and answer in a complete sentence, e.g. *"Glass is a solid“* and the others shall repeat it in unison.
- Next, the students return to their seats, where they complete the assignment on the worksheet.
- Students work independentaly and in the end we check the answers together. The students shall correct the mistakes on the worksheet in colour.

Classroom language:

What are solid, liquid and gas in Czech?	Co znamená *solid, liquid and gas* v češtině?
If you have a solid, please go to the SOLIDS.	Pokud máte pevné těleso, běžte k SOLIDS.
If you have a liquid, go to the LIQUIDS.	Pokud máte kapalinu, běžte k LIQUIDS.
If you have a gas, go to the GASES.	Pokud máte plyn, běžte k GASES.
Glass is a solid.	Sklo je pevná látka.

Supplementary activity 1:
The students shall make three columns on an empty sheet of paper (solids, liquids, and gases). The teacher shall say the word (examples: glass, a stone, a book, iron, sugar, a dog, a car, an umbrella, air, water, honey, ice, helium, yoghurt), and the

students shall write it in the correct column. We subsequently check the answers together.

Supplementary exercise 2 (discussion):

1. Imagine you are a spider that can see much smaller things than men can. What substances will the spider not see as substances because of its size?

2. Which substance can exist in various states?

3. How can laundry hanging outside gets dry despite freezing temperatures?

Freezing and defrosting

Recommended grade: 6.
Purpose of activity: Identification of what happens to a solid after it has been frozen and defrosted.
Target language: *Frozen (freeze), melted (melt)*
Cross-curricular relationships: Chemistry
Aids: Worksheet with chart, water, ketchup, oil
Time allowed: 2 x 15 minutes

Phase 1:

- On the blackboard, we write the first material – glass of water – and we ask the students what they think will happen when water in the glass freezes. Based on their knowledge and understanding, the students shall make their predictions, justify and record them in the column of the chart labelled *Predictions* (if a simple discussion suffices, a worksheet will not be necessary).
- We then ask if the compound shall remain the same if we reheat it and it melts. The students shall write the answer *Yes* or *No* in the table, accordingly (class discussion is also possible without the need of recording).
- We proceed similarily for the remaining compounds.
- We prepare frozen samples for the next class or assign the experiment to the students as homework, asking them to record the experimental results in the table.

Phase 2:

- If we do not assign the experiement as homework, we bring frozen samples to the next physics class and compare the results with hypothesis. We then melt them and again comment on the results.
- If the students made their observations at home, we open a class discussion about the results.

Classroom language:

What is going to happen when the (glass of water) freezes?	Co se stane, když voda ve sklenici zmrzne?
Will it be the same again after it melts?	Zůstane stejný/á, když roztaje?

Units and quantities
Recommended grade: 6.
Purpose of activity: Division of terms into units and quantities
Target language: Physical units and their quantities
Aids: Worksheet
Time allowed: 15 minutes

- We write the words UNIT and QUANITITY on the blackboard in large letters.
- On individual cards we write various quantities and units.
- Divide the students into teams.
- We show a card at random and read the word.
- A team leader shall be selected who must quickly smack the right word with his/her hand (either UNIT or QUANTITY).
- In the end, we place all units and quantities under the correct heading.

Classroom language:
Please sort out the units and qunatities from the middle column.
Place the units into the column on the left.
Place the quantities into the column on the right.
Is length a unit or a quantity?

Supplementary exercise:
The students shall provide the correct unit for each quantity, and vice-versa. We ask the students what other quantities and units they know: *"What other quantities and units do you know?“*

Measuring the proportions of the human body
Recommended grade: 6., 8.
Purpose of activity: Measurement of the specific proportions of the human body
Target language: Units of measure, parts of the human body
Cross-curricular relationships: Mathematics, natural science
Aids: Measuring tape, worksheet with table
Time allowed: 10 to 15 minutes

- Tell the students how and what to measure on their bodies: body height, arm span, distance from the elbow joint to their wrist, foot size, vertical head size, arm length
- The children shall measure each other in pairs. If the number of students is odd, the teacher joins in. Demonstrate how to perform the measuring.
- The children write the information into their table. They write their own data in one column, and their friend's data in the other.
- The students may then compare each other.
- Finally, we focus the students' attention on human proportions – arm span is roughly equal to body height, the distance from the elbow joint to the wrist is equal to the foot size, face height is equal to hand length.

Classroom language:
We are going to measure how tall you are, your arm span (from your middle finger on your left hand to your middle finger on your right hand), the length of your forearm (from the inside of your elbow to your wrist, and your foot.
Your arm span is rouhhly equal to your height.
Your forearm is roughy equal to the size of your foot.
The length of your face is roughly equal to the length of your hand.

Note: Additional facts concerning body proportions may be found at:
http://en.wikipedia.org/wiki/Body_proportions

How do we keep a sugar lump dry?
Recommended grade: 6.
Purpose of activity: Placing a sugar lump at the bottom of a beaker and ensure that it does not get wet
Target language: Universal
Cross-curricular relationships: Chemistry
Aids: Cellophane, glass, string, glue, scissors, adhesive tape…
Time allowed: 15-20 minutes

- We prepare a beaker of water and a plastic lid on which we place a cube of sugar.
- We ask the students if it is possible to place the sugar to the bottom without getting it wet: *"Can you place the sugar to the bottom of the beaker without getting the sugar wet? Please try, using the materials on your desks.“*
- Students in groups are provided various aids and materials that they may use to try and keep the sugar at the bottom of the beaker with. They simultaneously discuss how it can be done.
- We walk round the classroom and observe how the students work.
- We ask them to finish their experiment and whether they were successful in keeping the sugar cube at the bottom: “*Did you manage to keep the sugar cube at the bottom? How? What did you use?" so that* students can answer: *“We used a/an…“* and simultaneously demonstrate it.
- We then demonstrate the correct procedure. We fasten the lid with the sugar to the bottom of the neaker which we then turn upside down.
- The sugar remains dry. We ask the students how it is possible: *”How is it possible?“*

Classroom language:

Can you get the sugar to the bottom without getting the sugar wet?	Dokážete dostat cukr ke dnu, aniž by se cukr smočil?
Please try it using the materials on your desks.	Zkuste to, prosím, a použijte materiály na vašem stole.
Did you manage to get the sugar to the bottom?	Podařilo se vám dostat cukr ke dnu?
How? What did you use?	Jak? Co jste použili?
We used a/an…	Použili jsme …

Yo-yo experiment

Recommended grade: 7.

Purpose of activity: Using a yo-yo toy as a pendulum and to measure its period under various conditions

Target language: *Pendulum, swing back and forth, oscillation*

Cross-curricular relationships:

Aids: Yo-yo, stopwatch, table

Time allowed: 15 minutes

- We ask the students to bring a yo-yo into class.
- We use it as a pendulum. We first ask the students to guess how many times it will swing back and forth during a given period (e.g. 1 minute): "*How many times will the yo-yo swing back and forth in 1 minute? What do you think?"* The students guess. We then demonstrate it with our own yo-yo and count the swings alojgside the students, releasing the yo-yo at an angle of 90°: *"Please count together with me, how many times the yo-yo swings back and forth in 1 minute."*
- We then ask the students to do the same with their own yo-yo: *"Count how many times your yo-yo swings back and forth in 1 minute."* We count the time ourselves or ask a student to do it.
- We ask each student for the number of cycles: *"How many times did your yo-yo swing back and forth in 1 minute?"*
- We first ask why the number of cycles in individual yo-yos differs: *"Why do you think you have different numbers?"*
- We then ask what factors influence the number of cycles: *"What can affect this number?"* The students, e.g. answer: *"The length of the string, the weight of the yoyo…*The students gradually shorten the string of their yo-yo. They shall swing it each time and *count the number of cycles per minute.* They record the data in the *table in the worksheet.* In the next experiment we perform with the yo-yo, we observe the yo-yo with maximum string length (if possible, we hang the yo-yo from the ceiling). The students again guess how many cycles per minute the yo-yo will swing. What did we discover?

Classroom language:

How many times will this yo-yo swing back and forth in 1 minute?
What do you think?
Please count with me how many times this yo-yo swings back and forth in 1 minute.
Count how many times your yo-yo swings back and forth in 1 minute.
How many times did your yo-yo swing back and forth in 1 minute?
Why do you think you have different numbers?
What can change this number, the length of the string, the weight of the yoyo..?

Supplementary exercise:

In higher grades, we can plot an inverse proportionality graph.

Which materials are conductors?
Recommended grade: 6.
Purpose of activity: Experimental determinsation of which objects conduct electricity
Target language: C*ircuit, to carry energy/conduct electricity,* simple present tense *does/doesn't*
Aids: Worksheet
Time allowed: 10 minutes

- Students shall prepare objects at their desks to evaluate whether or not they conduct electricity.
- The experiments can be performed in pairs; but each student uses his/her own worksheet and fills in the sentences using the auxilliary verbs *does* or *doesn't*.
- When they finish their experiments with the materials, they shall read their findings.
- The worksheet includes diagrams with an vacant box. The students will draw additional objects at their discretion that they wish to repeat the experiment for (it is best to use to objects currently available to them).
- While the students work, we observe their efforts and as necessary, help or advise them.
- The students may fill in the short text below the diagrams as homework (instructor's decision).

Classroom language:

Today we are going to investigate which materials conduct electricity. Test the materials shown in the diagrams.	Dnes budeme zjišťovat, které materiály vedou elektřinu. Otestujte materiály uvedené v diagramu.
*Use the pair "**does/does not** to complete the sentences.*	Použijte ***does/doesn't*** k doplnění vět.
Now try some of your own	Nyní vyzkoušejte některé vlastní.
Find some objects to test, and draw them in the vacant boxes.	Najděte několik předmětů k otestování a nakreslete je do prázdných rámečků.
Then record your findings.	Potom zapište svá zjištění.

conductor complete loop energy

A circuit will only function if it is _____. This means that it must make a complete _____; otherwise, the _____ can't flow. If a material carries the electrical energy and allows the bulb to light, it is a _____.

Conductors and insulators – a crossword puzzle

Recommended grade: 6.
Purpose of activity: Identification of words in the crossword puzzle
Target language: See worksheet with crossword puzzle
Aids: Crossword puzzle
Time allowed: 10 minutes

- We give all students the same crossword puzzle.
- If they have never solved one before, we explain how it is done. The terms acquired from the written legend are progressively crossed out as the imaginary squares are marked in all directions (vertical, horizontal, diagonal right, left).
- The students shall mark insulators in red crayon and conductors in green crayon.
- The only thing remaning then is to begin and investigate. The student that finds the greatest number of words in the given time, wins. Note: The words that are crossed out in this crossword puzzle are not solutions.

Everything carries a charge
Recommended grade: 6.
Purpose of activity: Experimental determination of which objects conduct electricity
Target language: General
Aids: Comb, watertap
Time allowed: 10 minutes

- We tell the students that we will peform a little magic.
- We comb our hair with a comb.
- If possible, we gather the students around the tap.
- We turn on the tap so that water runs out in a weak current.
- We place the comb near the current of water. The water should bend towards the comb.
- We ask if anyone can explain this phenomenon: *"What makes the water bend toward the comb? What is happening ?“*
- The students explain the physical phenomenon in their mother tongue. An explanation in English may sound something like the following: *Running a comb through your hair causes friction which removes electrons from your hair and onto the comb. This charges the comb with static electricity imparts a negative charge to it. When you move the comb near the water, its negative charge displaces some of the negative charge of the water, leaving the water positively charged. Positive and negative charges attract, so the water bends toward the comb.*

Supplementary exercise:
The students try to charge various objects with static electricity.

Magnetic and non-magnetic materials

Recommended grade: 6.
Purpose of activity: Experimental determination of which objects are magnetic and which are non-magnetic
Target language: *Magnertic, non-magnetic*
Aids: Magnet on a fishing rod (a toy may be used)
Time allowed: 10 minutes

- We prepare a sufficient quantity of common day materials (if possible, one for every student or pair of students, as necessary) and a small fishing rod at the end of which we hang a magnet. Examples of objects are listed in the table.
- We write the names of objects we prepared including the material from which they are made (see examples in the table below).
- We cut up the cards and insert them into the box. The students draw a card in turn. They read what is written on the card and using the fishing rod, draw the given object among the rest. The object either magnetically adheres to it, or it does not; the students immediately determine, whether it is magnetic or ferromagnetic. If they do not know a word, they may look it up in the dictionary.
- The students shall also describe the material it is made from.

RULER – PLASTIC	DRINKING STRAW – PLASTIC	CUP - PORCELAIN	STRING - ACRYLIC
TOOTHPICK – WOOD	SPOON - SILVER	FOIL - ALUMINIUM	DOOR HANDLE - STEEL
BOTTLE STOPPER – CORK	PAPER CLIPS – METAL	SCISSORS – METAL	NEEDLE – METAL
PIECE OF WIRE – COPPER	KEY – IRON	T-SHIRT – TEXTILE	BOOK – PAPER
PET BOTTLE – PLASTIC	NAIL – IRON	A TIN OF TEA– METAL	CARDBOARD – PAPER
SLICE OF BREAD – FLOUR,WATER	CD – POLYCARBONATE	TROUSERS – TEXTILE	GLASS – GLASS
RING – GOLD	MARBLE – GLASS	POSTCARD – PAPER	HAIR CLIP – METAL

Classroom language:

What is it?	Co je to?
What is it made of?	Z jakého materiálu to je vyrobeno?
Is it magnetic/nonmagnetic?	Je to magnetické/nemagnetické?
Make a note on your worksheet.	Zapište si do pracovního listu.
It is…	To je…
It's made of …	Je to vyrobeno z…
It's magnetic/nonmagnetic.	Je to magnetické/nemagnetické.

Space – a crossword puzzle
Recommended grade: 9.
Purpose of activity: Location of missing words in the crossword puzzle
Target language: See crossword puzzle
Cross-curricular relationships: Geography
Aids: Worksheet with crossword puzzle
Time allowed: 10 minutes

- We distribute the crossword puzzles to the students.
- If they have never solved one, we explain how it is done The terms acquired from the written legend are successively crossed out as the imaginary squares are marked in all directions (vertical, horizontal, diagonal right, left).
- To make the crossword puzzle a little more interesting, we read to the students definitions of the planets and other objects in space. The students must then find the given word and circle it in the crossword puzzle and cross it out from the list of words underneath it.

Alternative:
The only thing alternative is to start investigating. The student who finds the greatest number of words in the time allowed, wins. Note: The words which are crossed out in this crossword puzzle are not solutions.

Classroom language:

It‘s the star at the centre of our solar system (Sun)
It is the fifth planet from the Sun. This gas giant is the largest planet in our solar system (Jupiter).
It is the sixth planet from the Sun. This gas giant has large, beautiful rings (Saturn).
It is a dwarf planet whicht is usually the farthest planet away from the Sun. It is smaller than the 8 other planets (Pluto)
It‘s a gas giant and is the seventh planet away from the Sun. (Uranus)
It is a gas giant and is usually the eighth planet away from the Sun. (Neptune)
It is the planet closest to the Sun (Mercury)
It is the second planet away from the Sun. It‘s the hottest planet in our solar system. (Venus).
IIt is the third planet from the Sun and the planet we live on (Earth).
It is a red planet and the fourth planet from the Sun (Mars).

It is a small, frozen mass of dust and gas revolving around the sun and usually forms a long tail of ions (comet)
A celestial object seen as a point of light in the sky (star)
The three-dimensional continuous expanse extending in all directions and containing all matter (space)
The celestial body revolving round the Earth from west to east (Moon)
A spacecraft designed to carry persons into space (spaceship)

Sun
Recommended grade: 9.
Purpose of activity: Comprehension of text, location of information
Target language: Numerical data
Cross-curricular relationships: Geography
Aids: Worksheet
Time allowed: 25 minutes

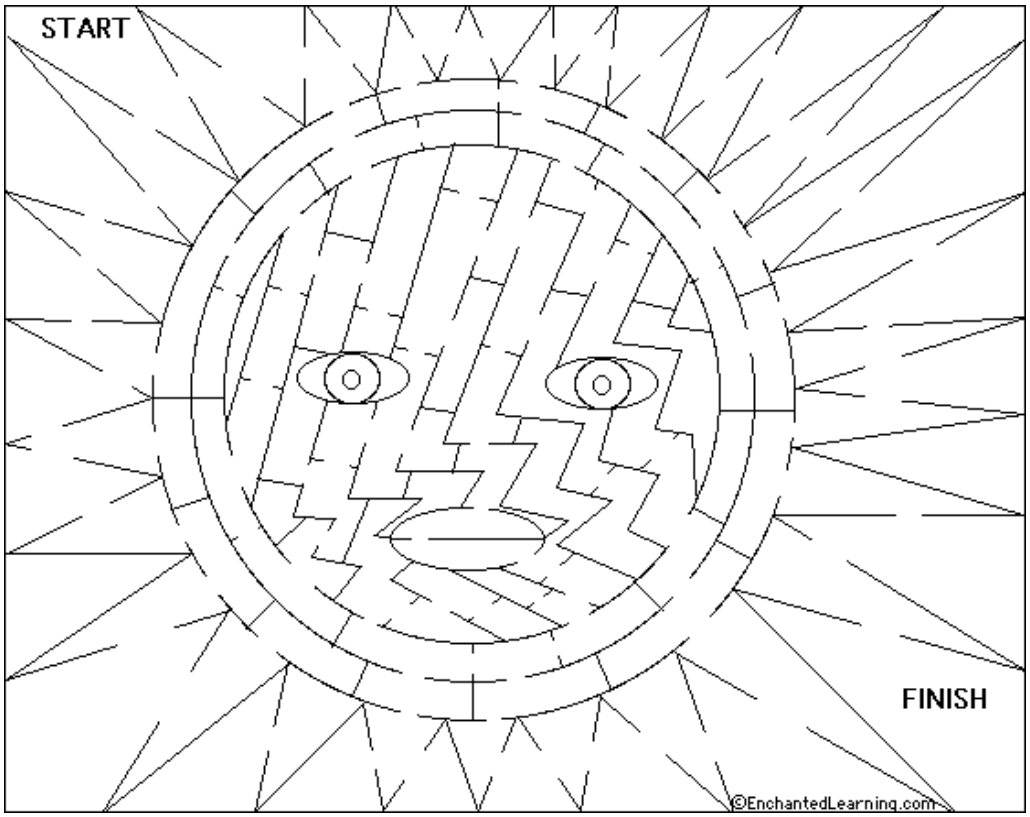
- We read jointly information about the Sun. Each student has his/her own copy.
- The students then answer the questions below the text.
- The student can then enter the sun labyrinth.

Alternative:
The students may create their own questions. We give them a clue on what to ask, e.g. *temperature of the Sun*,and they must create a correct question. They themselves determine which student shall answer.
More advanced students hide their text and create their questions either individually or in groups and without the instructor's help.

Supplementary questions:
How many kilometres are there in 1 mile?
What is the equivalent of 1 °F in Centigrade?

Supplementary exercise:

Sun Maze



After how many years will it disappear?
Recommended grade: 6.-9.
Purpose of activity: Division of materials according their disintegration time in combustion
Target language: Numerals and see cards
Cross-curricular relationships: Chemistry
Cross-disciplinary topic: Environmental Studies
Aids: Cards with words
Time allowed: 10-15 minutes

- We copy the worksheet and cut it up into cards.
- We write the following timespans beside each other on the blackboard (0-1 years, 1-100 years, 100-500 years, 500-1,000 years, 1,000-1,000,000 years).
- We give the cards to the students (a card dealing with the same subject must be limited to one student, i.e. card with the heading GLASS BOTTLE may be given to 2 or more students, depending on the number of students in the class; it will then be interesting to compare their hypotheses).
- Everyone makes certain that they understand the word written on their card. If not, they shall e.g. ask: *"What is Styrofoam?"* or *What does "Styrofoam" mean?"*
- We then ask the students to place the object described on the card against the time it takes for it to desintegrate following combustion: *"If you burn the object, how long do you think it will take for it to disappear? Place you card in the correct column, please."*
- The students go to the blackboard in groups and separate their objects.
- After everyone has placed his/her card before the time allowed has expired, they review all cards and check that they have been correctly placed, that the meaning of the word is understood and that it is pronounced correctly (the class shall repeat each word altogether).
- The students shall certainly be prepared to state how long it takes for a burning object to disappear from the surface of the Earth.

Classroom language:

What's Styrofoam?	Co je styrofoam?
What does Styrofoam mean?	Co znamená styrofoam?
If you burn this object, how long do you think it will take to disappear?	Pokud spálíte tento předmět, jak dlouho myslíte bude trvat než zmizí?
Place your card in the correct column.	Umístěte kartičku do správného sloupce.
I think a (cotton sock) will take …….. to disappear.	Myslím, že (bavlněná ponožka) zmizí …
A (cotton sock) will take 5-6 months to disappear.	(Bavlněná ponožka) zmizí/se zcela rozloží za 5-6 měsíců.

Correct answers:
A disposable nappy:, 500-600 years, a cotton sock, 5-6 months, A Styrofoam cup, 1 million years or more, a glass bottle, 1 million years or more, a leather belt, 40-50

years, a wooden block, 10-20 years, a banana peel, 3-4 weeks, a paper box, 1-2 months, a plastic bottle, 1million years or more, an aluminum can, 200-500 years. http://tonto.eia.doe.gov/kids/resources/teachers/pdfs/LandfillPrimary.pdf

Solar panels
Recommended grade: 8.

Purpose of activity: Measurement of temperature, determination of cup in which water is hotter
Aids: 4 plastic cups, black and white paper, water, thermometer, elastic bands, scissors, plastic wrap, worksheet with table
Time allowed: 20 minutes

- The students carry out the investigation in groups. Each group shall be given a set of aids.
- We ask the students to cut out two black and two white circles of the same size as the bottom of the cup: *“Please cut out four paper circles each, two white and two black, to fit the bottom of the plastic cups.“*
- The circles of paper are then placed at the bottom of the cup and 100ml of cold water is poured over them. They shall measure the temperature of the water and record it in the table (see below): *"Place the circles at the bottom of the plastic cups and pour 100ml of cold water into each cup. Record the temperature of the water.“*
- The students cover one cup bottom with a white circle and one with a black circle and the plastic wrap or the plastic bag and secure it with a rubber band: *"Cover one black and one white plastic cup with clean film and a rubber band.“*
- We place the cups in a sunny place. After 10 minutes, the students measure the temperature of the water in the cups and measure it again: *"Place the plastic cups in a sunny place and after 10 minutes measure the temperature of the water again.“*
- "*Calcute and record changes in temperature.“*
- Together, we summarize our findings.

Volcanic eruption
Recommended grade: 6.-9.

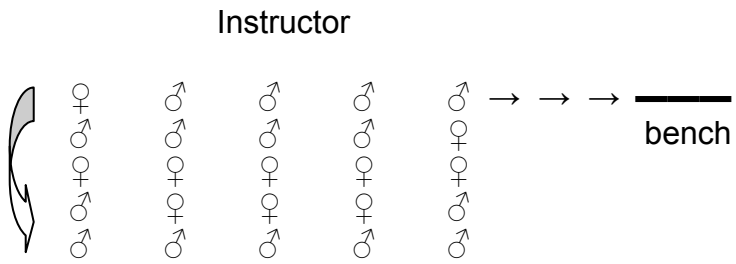
Purpose of activity: Modelling a volcanic eruption and understanding the principle of an eruption
Target language: Description of the method (simple past tense)
Cross-curricular relationships: Chemistry, natural science, geography
Aids: Plasticine, baking soda, vinegar, teaspoon, bowl
Time allowed:

- We give plasticine to the students and ask them to make their own volcano: *"You are going to make your own volcano."*
- They shall make a smallish ball from plasticine and form an orifice using a pen.
- They shall place the ball in the plastic bowl and model it into the shape of a volcano. They must make certain that the orfice is sufficiently wide.
- The students shall pour a teaspoon of baking soda at the base of the volcano and add drops of vinegar. After a while the volcano should become active.
- After we have performed the experiment, we ask the students what the purpose of the exercise was: *"Why did we do the experiment? What does it tell us about volcanoes?"* etc.
- We review the entire procedure, including what items we used for the experiment, how we proceeded, what happened and why, or draw a graph, if necessary, some students can try to describe the materials and method in English, others in Czech).

Classroom language:
We used a small ball of plasticine, baking soda, vinegar, a plastic bowl, and a teaspoon.
We made a small ball from plasticine and pierced a hole through the middle using a pencil.
We put the ball into the plastic bowl and made a volcano.
We placed a teaspoon of baking soda in the bottom of the volcano.
We added some drops of vinegar until it started fizzing.

General physics quiz
Recommended grade: 9.
Purpose of activity: Repetition of material covered, inolving a comptetition
Cross-curricular relationships: Mathematics
Aids: None
Time allowed: 10 minutes

- Students shall form groups (based on the number of students in the class) and line up in correct order.
- We ask questions (see tips below) addressed to the students standing in the first groups. He or she who answers first correctly may sit down. The rest go to the end of their lines.
- The instructor asks another question, also aimed at students standing at the beginning of each line. The whole process is repeated.
- The team whose members are all seated first is the winning team.



A. What is more?

- 1 dl or 1 cm^3? *[1 dl]*
- 5,000 seconds or 2 hours? *[2 hours]*
- 1 J or 1 kW.h? *[1 kW.h]*
- 2 km or 22 thousand dm? *[22 thousand dm]*
- 3 minutes or 150 seconds? *[3minutes]*

B. Czechs in the solar system (difficult)

- On which celestial body in the solar system is the Němcová crater located? *[On Venus; according to Nemcova, there is also an asteroid named Božněmcová (3628).]*
- Which celestial body in the solar system is called Masaryk? *[Asteorid (1841).]*
- On which celestial body in the solar system is there a crater called Heyrovský? *[On the Moon. Asteroid (3069) also bears the same name, given to it after Heyrovský.]*
- On which celestial body does the name Dvořák occur? *[This is a crater on Mercury. Asteroid (1055) also bears Dvořák's name.]*

C. Could these scientists have met one another?

- Volta and Ampère *[Yes, because they lived between 1745-1827 and 1775-1836 respectively]*

- Kelvin and Litr *[No, they could not have met, because there was no scientist called Litr; Lord Kelvin lived between 1824-1907.]*
- Archimedes and Aristoteles *[No, they lived between 287-212 B.C. and 384-322 B.C. respectively]*
- Planck and Maxwell *[Yes, they lived between 1856-1947, and 1831-1879 respectively]*
- Galileo and Newton *[No, they lived between 1564-164 and 1643-1727 respectively]*

D. Define a physical characteristic whose the unit of measurement is named after a scientist

- Blaise Pascal *[pressure (pascal)]*
- André Maria Ampère *[electric current (ampère)]*
- Michael Faraday *[electrical capacity (farad)]*
- Anders Celsius *[temperature (degrees Celsius)]*
- Albert Einstein *[none]*

Inventions and Inventors

- The steam engine *[James Watt]*
- The light bulb *[Thomas A. Edison]*
- The telephone *[A.G.Bell]* http://cs.wikipedia.org/wiki/Telefon*)*
- *Radioactivity [Antonie Henri Becquerel, Marie Curie-Sklodowská, Pierre Curie]*
- The lightning rod *[Prokop Diviš, Benjamin Franklin]*
- The laser *[Nikolaj G. Basov, Alexandr M. Prochorov, Charles H. Townes]*

Supplementary exercise:
The students can prepare a detailed quiz themselves for the next contest. It would be good if they also knew the correct answers to their questions. We shall specify what types of questions should be asked.

Sound – a crossword puzzle
Recommended grade: 8.-9.
Purpose of activity: Completion of the crossword puzzle words using the legend
Target language: *Sound, ear, pitch, vibration, voice box*
Aids: Worksheet with crossword puzzle
Time allowed: 15 minutes

- Students shall form teams.
- Each team shall be given a crossword puzzle or we can hand out a copy to each student. They can discuss the answers with members in their group.
- The students shall find a legend to missing words below the crossword puzzle.
- We shall set a time limit for the crossword puzzle.
- The team which has correctly filled in all spaces of the crossword puzzle (or has the greatest amount of correct words), wins.
- Lastly, we review all of the words and their definitions together or explain them, as necessary.

Substance of light
Recommended grade: 9.
Purpose of activity: Dictation and supplementing of the correct terms in the text
Target language: *Light, wave, photons, invisible, vacuum…*
Aids: Paper, pencil
Time allowed: 10 minutes

- We read out the following short text to the students, but instead of the words written in bold letters, we will speak the word *banana*. The students themselves must find out what word belongs there.

- Light is both **waves** and particles called **photons**.
- Some light is visible (i.e. red, orange, yellow, green, blue, indigo and violet) and some is **invisible** (e.g. infrared, ultraviolet, gamma rays, and Xrays).
- Light travels in **a straight line** .
- The speed of light in a vacuum is **300,000,000 m / s** . Light travels more **slowly** in denser media such as glass or water.

Reflection of light
Recommended grade: 9.
Purpose of activity: Illustration of the described situation
Target language: *Angle of reflection of a ray of light, distance, mirror*
Cross-curricular relationships: Geometry
Aids: Paper, pencil
Time allowed: 10 minutes

- The students may work alone, in a group, or together with the class.
- We write the assignment on the blackboard: 1. ***The angle of incidence of a ray of light is equal to its angle of reflection.*** 2. ***The object in front of a mirror is at the same distance as the image behind the mirror.***
- According to the task, the students draw a diagram with descriptions that illustrate the given situation.
- Lastly, we check the answers together.

Classroom language:

Draw labelled diagrams to illustrate the situations.	Nakreslete diagramy s popisky, který ilustruje situace.
The angle of incidence of a ray of light is equal to its angle of reflection.	Úhel odrazu světelného paprsku se rovná úhlu odrazu.
The object in front of a mirror Is at the same distance as the image behind the mirror	Předmět před zrcadlem je stejně vzdálený jako obraz za zrcadlem.

OPeration of a coal-fired power plant

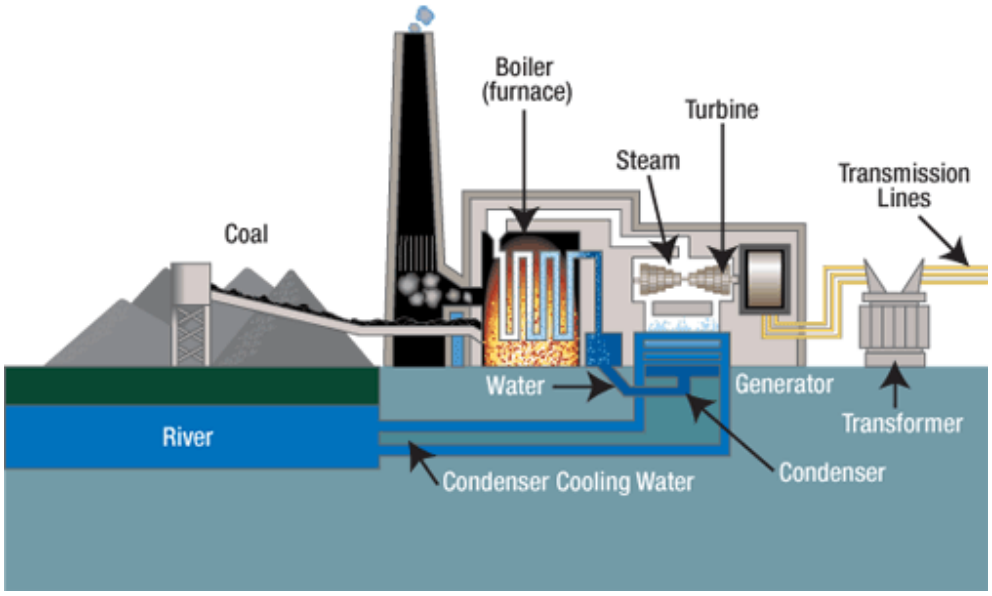
Recommended grade: 8.
Purpose of activity: Description in the correct order,of the process in a coal-fired power plant
Target language: See text
Aids: Strips of paper with sentences
Time allowed: 10 minutes

- Students shall form teams of five.
- Each team will be fiven a description of how a coal-fired power plant operates cut into individual sentences: *"These are statements describing how a coal-fired power station works.“*
- *"Take one statement each. "Put the statements in the correct order by standing in line.“*
- The first team to arrange itself correctly, wins.
- The students write the correct wording of the text in their notebooks: *"Please write the statements in the correct order in your exercise books.“*
- Lastly, we review what occurs in a coal-fired power plant and demonstrate it using a picture.

Classroom language:

These are statements describing how a coal-fired power station works.	Toto jsou věty popisující, jak funguje uhelná elektrárna.
Take one statement each, please.	Vezměte si každý jednu větu, prosím.
Put the statements in the correct order by standing in line.	Seřaďte věty do správného pořadí. Postavte se do řady.
Please write the statements in the correct order in your exercise books.	Prosím zapište si věty do svého sešitu.

Coal-Fired Power Station



Coal-fired power stations produce electricity by burning coal in a boiler to heat water and to produce steam. The steam at extreme pressure flows into a turbine, which turns a generator to produce electricity. The steam is cooled and re-condenses to form water, which is then returned to the boiler to start the process all over again.

Drama in space

Recommended grade: 9.
Purpose of activity: PLaying out a scene according to a given script
Target language: See text
Aids: Worksheet with text
Time allowed: Variable

- We first ask the students if they know what a sketch is.
- We then read together a dialogue (it would be a good thing to read it several times, with pairs of students taking turns to read the sketch).
- The students shall then talk in their own words about what was said in the dialogue. We can help them by asking questions.
- When we are certain that the students understand the story, we ask them to practise the dialogue in pairs. We do not insist that they should know it by heart, but we allow them to impersonate and simplify.
- Lastly, the students shall perform the sketch in front of the class.

Classroom language:

Do you know what the word "sketch" means?	Víte, co znamená slovo skeč?
Let us read this sketch.	Přečtěme si tento skeč.
What is it about?	O čem to je?
Practise the dialogue in pairs.	Nacvičte rozhovor ve dvojicích.
You can simplify it, make it shorter.	Můžete ho zjednodušit, zkrátit.
Now act out the sketch.	Nyní sehrajte skeč.

Mystery word
Recommended grade: 6.-9.
Purpose of activity: Guessing the word
Target language: Discretionary
Aids: None
Time allowed: Variable

- Students play in teams. The goal is to determine the mystery word that the teacher or student has in mind.
- It is a word of four or more letters. The word selection may be narrowed down to a single topic, e.g. the state of matter, magnetism, etc. It must relate to material that the students already know.
- We let them know how many letters our word has.
- The first team offers a word with the same number of letters chosen from the topic provided.
- If they guess correctly, but their proposed word contains at least some of the letters contained in the mystery word, we write those letters on the blackboard.
- The second team in line then tries to guess the mystery word. This time it has a clue, a letter or letters which the word contains.
- If the second team also fails to guess the word correctly, we write at least one letter contained in the word on the blackboard.
- We continue in this way, until the students guess the mystery word (but to prevent endless guessing, however, we can set a time limit).

Note: If we want to help the students a little, we can write the letters in the correct order as they appear in the word, e.g. the mystery word shall be *magnetism*, the students succeed in getting the letter M: M_ _ _ _ _ _ _M

Classroom language:

I am thinking of a mystery word.	Myslím si záhadné slovo.
It has got (9) letters.	Má (9) písmen.
Take a guess.	Hádejte.
The letter (M)is in the word.	Ve slově je písmenko (M).

Alternative:
Students play in pairs.

How sound travels
Recommended grade: 8.
Purpose of activity: Construction of a simple telephone and its use for communication
Target language: Discretionary
Cross-curricular relationships: Geography, civics
Aids: Plastic cups, string, scissors
Time allowed: 20 minutes

- Each pair of students has two yoghurt plastic cups and a sufficiently long piece of string.
- Connect both cups using the string (make a little hole in the bottom of the cup to put the string through and make a knot) – we demonstrate and help, if necessary.
- We divide the class into continents (Europe, Asia, Africa, Australia, America) and the students shall call one other, each of them being in a different part of the world.
- While one of the pair of studens puts the cup to his/her lips and talks, the other holds it to his/her ear and listens. The conversation may concern any topic (weather, how we are doing, what we are doing at the moment, what we will do during the vacation, etc.).

Classroom language:

Make a hole in the yogurt cups.	Udělejte v kelímku otvor.
Put the string through the hole.	Protáhněte jím provázek.
Tie a knot.	Udělejte uzel.
Africa is here.	Afrika je zde.
America/Europe/Asia/Australia is over there.	Amerika/Evropa/Asie/Austrálie je tamhle.
You are in Europe and you are in Africa.	Ty jsi v Evrop\u283 e a ty jsi v Africe.
Use your telephone.	Použij telefon

Shadows

Recommended grade: 7.
Purpose of activity: Measurement of the length of a shadow at various times of day and comparison of their time relationships
Target language: *Length, to measure, shadow*; comparing adjectives
Cross-curricular relationships: Mathematics
Aids: Chalk, measuring tape, metre rule, worksheet

- We erect a pole/post about 2-3 metres high in the playground or school garden on a sunny day.
- Students measure the length of the pole's shadow on the ground and record it in the table. They outline the shadow with chalk or other aid.
- They repeat the measurement every hour, record it in the table and plot a graph showing the length of the shadow at various times of the day.
- Based on the observations, we jointly summarize what we discovered. We can ask about changes in position and length of the shadow at a specific time, when the shadow was the shortest and when it was the longest, etc.

Classroom language:

Measure the length of the shadow.	Změřte délku stínu.
Draw a line on the ground.	Na zem nakreslete čáru.
Measure the shadow every hour.	Měřte stín každou hodinu.
What have we found out?	Co jsme zjistili?
Did the shadow stay in the same place?	Zůstal stín na stejném místě?
Why did the shadow change length?	Proč se délka stínu měnila?
When was the shadow longest?	Kdy byl stín nejdelší?
When was the shadow shortest?	Kdy byl stín nejkratší?
What was the length of the shadow at 2 p.m?	Jaká byla délka stínu ve 2 hodiny odpoledne?
Draw a graph using your results .	Zaneste své výsledky do grafu.
Can the positions of the sun and the earth on one day explain the changes of the length of your shadows?	Může pozice Slunce a Země během jednoho dne vysvětlit změny v délce stínů?

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Electric circuit

Recommended grade: 8.
Purpose of activity: Drawug of an electric circuit
Target language: *Light bulb, resistor, coil, switch, voltmeter, battery; numbers 1-6*
Aids: Dice, paper
Time allowed: 15-20 minutes

- Each group shall receive a playing dice and sheet of paper.
- On the blackboard, write numbers 1 to 6, representing numbers on a dice.
- Beside each number we draw the schematic label of components that we will use for making the electric circuit, e.g.
  1 LIGHT BULB (symbol) 4 SWITCH (symbol)
  2 RESISTOR (symbol) 5 VOLTMETER (symbol)
  3 COIL (symbol) 6 BATTERY (symbol)
  Wires are automatically drawn.
- The students in their groups shall take turns rolling the dice and, according to the number on the dice shall draw the corresponding component, e.g if they roll a 5, they add a voltmeter; if they roll another 5, they add another voltmeter to the circuit, so that a circuit is created with various numbers of different components.
- As soon as the circuit has received at least one specimen of each component, the students end the game.
- Lastly, we ask how many light bulbs, resistors, etc. their circuit has: ”*How many (light bulbs) are there in you electric circuit?“*

Classroom language:

Number (1) is a (light bulb).	Číslo (1) je (oko).
Roll the die, please.	Hoďte kostkou, prosím.
What number is it?	Jaké je to číslo?
What's number (4)?	Co je číslo (4)?
Good, so draw the symbol for a (coil) in your circuit.	Dobře, tak nakreslete do svého obvodu symbol pro (cívku).
How many (light bulbs) are there in you electric circuit?	Kolik (žárovek) je ve vašem obvodu?

Optical illusions
Recommended grade: 7.
Purpose of activity: Description of illustrations
Target language: General
Cross-curricular relationships: Art class
Aids: Enlarged copies of illustrations
Time allowed: 10-15 minutes

- We prepare sufficiently large copies of illustrations so that the students in the back rows of the class can also see them (we allow them to move closer to the illustration, if necessary, to see it).
- The question is essentially the same: *"What can you see?"* A greater number of motives can be observed when looking at the illustration in detail.

Hint:

With the help of the students we can set aside an area in the classroom where we shall place various riddles and picture puzzles which the students can read during recess or during the remaining minutes in a class. Many are available on internet (http://kids.niehs.nih.gov/braint11.htm, http://www.childrenspuzzles.net/rebus/rebus-puzzles.php), or the students can make them up themselves to give to their classmates or friends. So that the collection of riddles and picture puzzles is not copied, it is a good idea to change them regularly.