# ⟨Project⟩ English and Science

OK, OK – I'll admit it: I don't know much about Science. But that's why we're going to find out about energy[1] and where it goes. At the end we'll do our own little experiment[2]. Great fun!

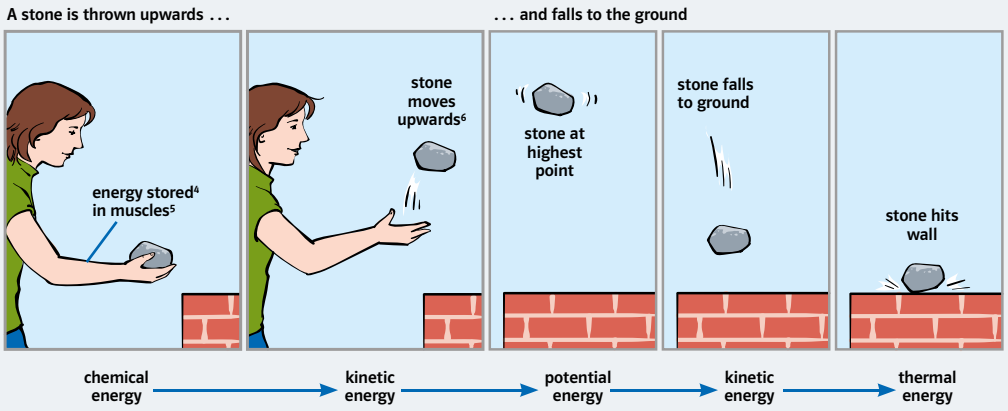
## STEP 1: Before you start: What do we need energy for?

*What do we need energy for?*
*Discuss in groups and make word webs.*




## STEP 2: Find out about energy changes[3]

a) *Read this page from an English Science book:*




To do work, you have to spend[7] energy. But, like money, energy doesn't disappear when you spend it. It goes somewhere else! People talk about "using energy", but energy is never used up[8]. It just changes into different forms, as in the example above.

When energy changes from one form to another, scientists say that energy is transformed. The diagram above shows a sequence of energy transformations.

The last one is from kinetic to thermal energy (heat[9]). When the stone hits the wall, it makes the atoms and molecules in the stone and the wall move faster, so the materials warm up[10] a little.

During each transformation, the amount[11] of energy stays the same. This is an example of the **law of conservation[12] of energy.**

adapted from: *Complete Physics* – by Stephen Pople

b) *Make a list of new science words in English that are similar[13] in German.*
*Example:* kinetic – kinetisch

c) *Which other forms of energy do you know?*
*Check the English in a dictionary.*

**TIP**

Many science words in English and German come from Latin or Greek. That is why they often look and sound very similar in both languages.

[1] **energy** ['enədʒi] = power that comes from oil etc. • [2] **experiment** [ɪk'sperɪmənt] = a scientist's test • [3] **change** [tʃeɪndʒ] = when sth becomes different • [4] **(to) store** [stɔ:] = collect sth and keep it somewhere • [5] **muscle** ['mʌsl] = parts of the body that are used to move • [6] **upwards** ['ʌpwədz] = up • [7] **(to) spend** [spend] = use • [8] **used up** [ju:zd 'ʌp] = not there anymore • [9] **heat** [hi:t] = very hot • [10] **(to) warm up** [wɔ:m 'ʌp] = get warm • [11] **amount** [ə'maʊnt] = how much there is of sth • [12] **conservation** [ˌkɒnsɜ:'veɪʃn] = saving • [13] **similar** ['sɪmɪlə] almost the same

## STEP 3: Do an experiment

a) *What energy changes happen around us all the time? Work with a partner and make a list.*

b) *Look at the experiment that is described on the right and then answer these questions.*

1. Which can[2] will roll[3] the furthest[4]? Why?
2. What energy changes happen?

c) *Now do the experiment. Which can actually rolls furthest? Why do you think this happens? (Tip: Think about thermal energy.) Repeat the experiment.*

d) *How can you adapt[7] or change the experiment to check your ideas?*

**Energy changes in a rolling can**

1. Take two cans which are the same size and form. One of the cans should be full of something which is fluid[1] or semi[5]-fluid, e.g. tomatoes[6]. The other can must be empty.
2. Build a slope and roll the two cans down the slope. Note which can goes furthest.

## STEP 4: Write down your experiment

The results of an experiment are presented in a special way. *Write down the experiment from Step 3. The Science skills can help you to write your text and use the right phrases.*

**SCIENCE SKILLS**

| | |
|---|---|
| 1. Hypothesis[8] | The goal of the experiment was to show ... We expected … because … |
| 2. Equipment | We used … We used the equipment which is shown … |
| 3. Method[9] | First we … Then we … We made it objective[10] by using … |
| 4. Results | We collected the results in a diagram / a list. |
| 5. Conclusion | Our hypothesis was correct. The results showed that …<br>Our hypothesis was not correct. We thought … but … The reason was … |

## STEP 5: Do a project: Your own experiment

Thermal energy can be lost every day, e. g. when hot things like tea cool down[11].

a) *Do an investigation[12] into how you can keep a liter[13] of water warmer longer.*

b) *Write a report as in Step 4. Present it in class.*

c) *Think about how you could use the results of this experiment to conserve energy at home (heating[14] …).*

**TIP**

Remember to use graphs and/or a table to present your results.

[1] **fluid** ['flu:ɪd] = *Flüssigkeit* • [2] **can** *(AE)* [kæn] = tin • [3] **(to) roll** [rəʊl] = *rollen* • [4] **furthest** ['fɜ:ðɪst] = greatest distance • [5] **semi** ['semi] = half • [6] **tomato** [tə'mɑ:təʊ] = a vegetable • [7] **(to) adapt** [ə'dæpt] = change sth to be used in a new situation • [8] **hypothesis** [haɪ'pɒθəsɪs] idea for sth that might or might not be correct • [9] **method** ['meθəd] = way of doing sth • [10] **objective** [əb'ʤektɪv] = getting results from facts and not from feelings • [11] **(to) cool down** [ku:l 'daʊn] = get colder • [12] **investigation** [ɪnvestɪ'geɪʃn] = examining a problem • [13] **liter** ['li:tə] = unit for an amount of water • [14] **heating** ['hi:tɪŋ] = *Heizung*