

IV. Reflected light

Key Question: How reflective are materials?



Student name:

Class:

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Activity 1. What happens when light shines on a mirror

1. In this experiment you need a torch and a mirror. Let the torch shine on the mirror in such a way that a bright spot appears on the wall or ceiling. What do you think is the reason that the spot appears there?

2. Does the mirror produce the light? ☐ Yes ☐ No

3. Which in your experiment is the "source light" and which is "reflected light"?

4. If you cover the source light, what happens to the reflected light?

5. If you cover the reflected light, what happens to the source light?

6. If you use a dark piece of material instead of a mirror, do you see a bright spot on the wall? Why?

7. Imagine you are behind your desk and light is falling into your room via a window. What do you think, which light enables you to see your desk (in other words which light is coming to your eyes), source light coming from a window or light reflected from your desk? Why?

Activity 2. Which material reflects the most light?

Now you are going to find out which materials are the best in reflecting light.

- Take a desk lamp, which illuminates your table well.
- Collect samples of materials you want to test, this can be a mirror, piece of wood, container with sand, shiny and dull fabrics, aluminium foil, etc.
- List the materials you will test in the table on the next page.



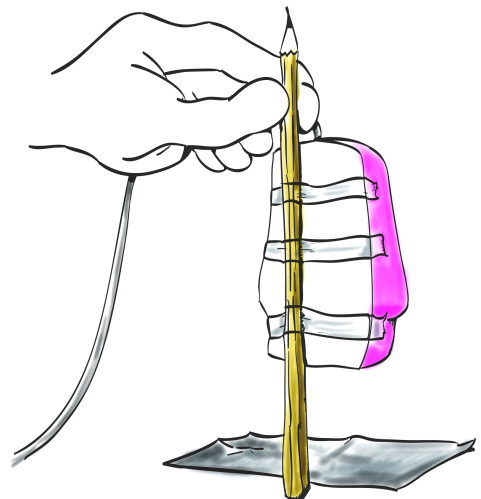
8. Predict the three materials that reflects light the best:

1.

2.

3.

- Place the materials on your desk.
- Fix €Sense so that it points straight down, towards the sample (you can do it by taping a pencil to €Sense). To make your experiment a fair test you must keep the light sensor at the same distance from the sample for each measurement (e.g. 5 cm).
- Pass the light sensor over each material one at a time. Don't let the shadow of your hand fall on the sample where the sensor is pointing.



- Write down the sensor reading for each material in the table.

MATERIAL	INTENSITY OF REFLECTED LIGHT IN %

9. Compare your results with your prediction. Do they show what you expected? Which materials were actually the best 3 reflectors?

10. What are properties of the best reflectors?

11. What are properties for the worst reflectors?

12. What kind of material is the best to wear in the dark if you want to be easily visible? Explain your reasoning.

Activity 3. Which colour reflects the most light?

In this activity you will investigate how different colours reflect light.

Your research question is "Which colour reflects the most light?"

- For your investigation you have a desk lamp and samples of paper in different colours.
- Design and describe a fair test to find out which colour reflects the most light.
Tip: you can use a similar measurement method as in the previous activity.

- Predict the brightness order of the tested colours, from lowest to highest.
Write your prediction in the table below.

COLOUR	PREDICTED RANK	INTENSITY OF REFLECTED LIGHT (LUX)	ACTUAL RANK

- Measure the light intensity of reflected light for each colour.
- Write down the actual brightness order of the colours.

13. Using your eye did you put the colours in the same order as when you used the light sensor?

☐ Yes, the same

☐ No, different

14. Which colour reflects the most light (is the brightest)?

15. Which colour reflects the least light?

16. Based on your light measurements do you think the sensor can see colour?
Why or why not? Give examples.

17. What colour clothes should you wear in the dark if you want to be easily visible?
Explain your reasoning.

Questions

- A.** Do you think that planet Earth has a high reflectivity, in other words reflects a lot of light? Why or why not?

- B.** Which places on Earth do reflect a lot of light and which do not?

- C.** How can we be safe when walking and cycling?

- D.** Suppose you were riding a bicycle in the evening. Do you think your clothes would be as bright as during the day? (test it yourself!).

- E.** Do you know why some lights and torches have a shiny back?

