1 Observation

1 **Put a pencil in a glass of water. Look at it. What phenomenon makes you see the pencil like that? Describe this phenomenon in your own words. Draw a picture of the pencil in the glass.**

Contents

Propagation of light

Reflection and refraction

Activities

Consolidation: 1 and 2

Interdisciplinary with Art: 1

Skills

Writing

Speaking

2 **Work in pairs. Look at the picture and answer. Explain your answers in class.**

a) What phenomenon explains why you see the mountain double and upside down?

b) Explain what this phenomenon consists in.

Name: _____

2 Reading comprehension

1 Read and listen to what King Tristan says about the phenomenon of the **rainbow** (Tracks 5 and 6). How does he explain it?

2 Read and listen to the **real explanation** for this phenomenon (Track 48). Then explain it with your own words.

3 Which shows based on **science** do Enid and her friends use to organise the rainbow party?

4 Which of these shows are based on the phenomenon of **refraction of light?**

5 Which of these shows use **transparent bodies** and which use **opaque bodies?**

Name: _____

3 Stimulating creativity

1 Work in groups to make a **coloured spinning top.**

Materials:
Compass, thin white card, cardboard, ruler, pencil and felt tip pens.

Procedure:

a) Using the compass draw two circles of the same size, one on the thin card and the other on the cardboard.

b) Cut them out and divide the circle on the thin card into three segments: colour one in green, one in red and the other one in blue.

c) Glue the two circles together and stick a pencil through the middle.

2 **a)** Spin the top and **observe what happens to the colours.** Describe it here. Then explain your conclusions in class.

b) Make another top using a **circle with seven colours** and spin the top. **What colour does the circle look now?** Why do you think this may be? Write your answers here and explain them in class.

Name: _____

4 Experimenting

1 We are going to do an experiment with a soup spoon. Work in groups. Each group will answer one of the questions in class.

a) Look at your reflection on the **inside** of the spoon. How do you see yourself?

_____

b) What is the inside part of the spoon like, is it **concave** or **convex?**

_____

c) Now, look at your reflection on the **outside** of the spoon. How do you see yourself?

_____

d) Now that you have made these observations, what kind of mirrors do you think dentists use, **concave** or **convex?**

_____

2 **Switch on a torch and place it on a table in a dark room. Place a mirror in front of the torch.**

a) Where does the ray of light shine? Is it where you expected it to be?

b) Now put a ball nearby and try to move the mirror until the light shines on the ball. Draw a picture showing the positions of the torch, the ball and the mirror.

Name: _____

5 Thinking

1 **Why is it that when we look through a we see things differently from usual?**

2 **Look at a Then answer these questions:**

a) What is the glass like? Is it thicker in the centre or at the edges?

b) What kind of is it, What kind of images does it form?

3 **Look at the glasses of a short-sighted person. What are the lenses like, are they thicker in the centre or at the edges? What kind of lenses are they, convergent or divergent?**

4 **Why do we sometimes get a rainbow** when a ray of sunlight shines through a **prism?**

Name: _____

6 Research

1 **Work in groups. We are going to do an experiment to separate the components of various colours.**

You will need:

Blotting paper, coloured felt-tip pens and a washing-up bowl.

Procedure:

a) Draw a dot in each colour at a distance of 1cm from the edge of the blotting paper. Include the colours **green, purple** and **orange.**

b) Glue the blotting paper to the top of the washing-up bowl leaving a little space between the lower edge of the paper and the bottom of the bowl (about 1 cm).

c) Put some water in the bowl up to the lower edge of the paper. **Observe what happens.**

2 **Based on the observations you have just made, answer the following questions. Take turns to explain your answers in class.**

a) What colours have appeared on the blotting paper from the **green** dot?

b) What colours have appeared from the **purple** dot?

c) What colours have appeared from the **orange** dot?

Name: _____

7 Think and answer

74 **1** **Read and listen to the following statements. Then say whether they are true (T) or false (F):**

- ☐ Light always propagates in a straight line.
- ☐ When light hits a mirror, it refracts.
- ☐ Convergent lenses are thicker in the centre than at the edges.
- ☐ Divergent lenses enlarge images.

Contents

Activities

Consolidation: 1
Extension: 2

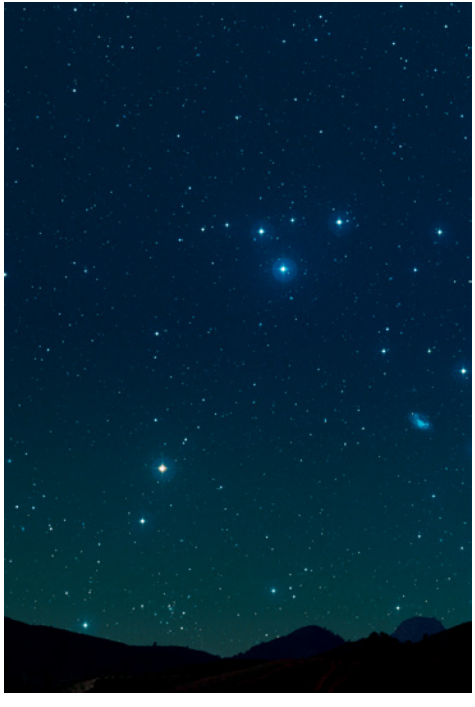
Skills

Reading
Listening
Writing

2 **Look for information on the internet to answer these questions.**

a) The planet **Venus** is one of the heavenly bodies in the firmament. Where does its light come from?

b) The planet **Mars** looks somewhat redder than **Venus** in the night sky.
What do you think this may be due to?



Name: _____

8 Learning skills

1 Look at **your shadow outside at midday.** Is it long or short?

2 Repeat the observation in the **late afternoon** (before twilight).
How has your shadow changed?

PINCH OF SALT

Content

Shadows

Activities

Extension: 1, 2 and 3

Interdisciplinary with Art: 3

Skills

Writing

3 Why do you think the **size of your shadow** has changed from midday to late afternoon? Explain it with a drawing.

Name: _____

9 Writing

1 Imagine a world with oceans that absorb all the **blue, green** and **violet rays of light** and plants that absorb all the colours. What would it be like? Describe it in a composition.

Contents

Decomposition of light

Colours

Activities

Extension: 1 and 2

Interdisciplinary with Language: 1 and 2

Interdisciplinary with Art: 2

Skills

Writing

2 **Now, imagine another planet with the following characteristics: it has two suns and clouds that absorb all the colours except pink. The plants reflect blue. The rocks absorb all the colours except green.**

Draw and write on a sheet of card a comic with four cartoon drawings describing the arrival of some terrestrial astronauts in a world with these characteristics.

Here are some guidelines to help you complete this activity:

a) Define the characteristics of the characters that are going to appear in the four scenes.

b) Define the setting. What does the place you are going to illustrate look like?

c) Write a short script with the texts and the dialogues that are going to appear in the speech bubbles.

Name: _____

10 Reading comprehension

75 **1** Read and listen to this text. Then work in pairs and take turns to summarise it aloud to your partner.

Two-way mirrors allow part of the light (say 10%) to pass through the mirror and they reflect the rest (say 90%). These mirrors are used in the interrogation rooms of police stations. If the suspect is in a brightly lit room and the police officers are in a dark room, the suspect can observe that the mirror reflects 90% of the light from the room, and only 10% comes from the observation room. Therefore he cannot see the police officers. From the other side the opposite occurs: the police officers see 10% of the light from the interrogation room,
but as this light is very intense, it is sufficient to enable them to distinguish the suspect clearly.

Contents

Reflection and refraction

Mirrors and lenses

Activities

Extension: 1 and 2

In group: 1

Skills

Reading

Listening

Speaking

Writing

2 **After reading and listening to the text, answer these questions:**

a) If the suspect at a police station **turned off the light** in the interrogation room, what would happen? Why?

b) If somebody **switched on the light** in the police observation room, what would the suspect see? Why?

Name: _____

Ana Alonso
The Rainbow Party
Illustration by Mercè Canals