Firrhill High School

Summary Questions: P3. Exploring the Universe

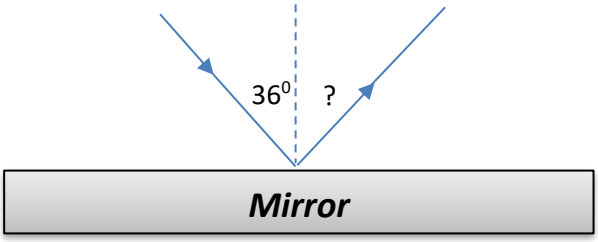
Before you answer these questions, look over your summary sheets and the success criteria from this topic.

1. LOOKING INTO SPACE

a) What is a solar system?
b) List the planets in our solar system in order, starting with the planet closest to the sun.
c) What is the goldilocks zone?
d) What is terrestrial planet?
e) What is a gas giant planet?

2. LIGHT – REFLECTION

a) Why instrument is used to view objects that are very far away (for example, the moon)?
b) What does light do when it is directed at a mirror?
c) What is the law of reflection?
d) Look at the diagram below. What angle would light be reflected at?



e) Copy the diagram above and label the incident ray, reflected ray, normal line, angle of incidence and angle of reflection.

3. LIGHT - LENSES

a) Draw a convex lens, label it and draw how light travels through a convex lens.
b) Draw a concave lens, label it and draw how light travels through a concave lens.
c) What is the focal point of a lens?
d) Calculate the power of a lens that has a focal length of:
   i. 0.01 m ii. 0.05 m iii. 0.003 m
e) Copy and complete the passage:

*_____ lenses can be used to correct short-sightedness. In short-sighted people the light focuses **in front of** the retina, light needs to be **spread out** so it can focus on the retina.*
*_____ lenses can be used to correct far-sightedness. In far-sighted people the light focuses **behind** the retina, light needs to be **brought closer together** so that it can focus on the retina.*

4. LIGHT - SPECTRA

a) What can be seen when light passes through a prism?

b) What is refraction?

c) Write down the colours of the visible spectrum in order.

d) A spectroscope is used to view the light given off from different objects. Describe what you saw through the spectroscope when looking at:

i. the reflection of the sun's rays ii. the light from the gas element

e) What can astronomers find out by looking at the light given off from stars?

5. FORCES

a) What is mass?

b) What is weight?

c) What is force measured in (the 'units' of force)?

d) What is the gravitational field strength of earth?

e) How would your weight change:

i. in deep space? ii. on Jupiter?

f) Calculate the weight of these objects on earth:

i. A 0.003 kg apple ii. A 50 kg pupil iii. A 2000 kg whale

6. ROCKETS

a) What is the name of the force that pushes a rocket upwards?

b) Copy and complete the passage:

In a rocket the _____ force from the engines must be _____ than the _____ (a force due to gravity) for it to be able to move upwards.

c) In class you designed your own rocket. Draw a diagram of your rocket and label it to show why you designed your rocket this way.

7. LIFE IN SPACE?

a) Write down the meanings of these words:

i. Habitat ii. Colonise iii. Limitation

b) Which planet in our solar system would be the best suited for humans to colonise?

c) List three limitations of colonising that planet.

d) Chose one limitation and write down a possible solution for it.

e) Read the passage below:

There is much debate about whether there is water found on Mars. In 2011 photos showed that dark streaks appear on Mars seasonally, it is suspected that this is because of salty water flowing down slopes. A separate mission also took photos of what looks like ice at the bottom of craters. If there is ice present, when the ice melts in turns straight into gas and evaporates. Other scientists however do not believe water is present, the dark streaks could be formed by dry sand being moved by the wind. It is also suggested that the pictures of 'ice' could actually be showing something else that we don't yet know about.

Do you think there is water on Mars? Explain your answer.