



LOOKING FOR LIFE - ACTIVITY SHEET 01

We know quite a lot about the planets in the Solar System.

We have several ways of learning about planets:

- **Looking through Earth-based telescopes.**
- **Using space telescopes, like the Hubble Space Telescope.**
- **Studying the light they reflect, to find out about their atmospheres.**
- **Sending spacecraft to fly close-by, or even to land on their surfaces.**

One day we may even send astronauts to visit another planet, such as Mars.

We would really like to know if any of the planets (or their moons) have life on them.

- What should we look for, to see if a planet might be suitable for life?
- What should we look for, to see if a planet actually has life on it?

Mission to the stars.

One day, we may have to leave Earth.

The Sun may start to expand as it nears the end of its life, or there may be an environmental disaster. How can we escape? How can we ensure the future of the human species?

Imagine that this is your mission.

You and your friends are to board a spacecraft, where you will be put into a deep sleep.

After hundreds of years, your craft will reach a different planetary system, orbiting a different star.

You will be woken up, and then your work begins.

You will have to examine the planets of this new solar system.

You will study their orbits and look for signs of life.

- **Your task is to design your spacecraft.**

What instruments must it have, in order for you to examine the new planets?

How will you decide which is the most suitable for life?

Where will you land, to establish a new human colony?

- **It is up to you how you present your ideas.**

As a poster, or as a piece of written work, or as a presentation to the class.

Happy landings!





CHANGING THE EARTH- ACTIVITY SHEET 02

**We live on the Earth. It is a great home for life.
Now imagine that you could change the Earth.
What would happen? Would we still be able to live here?**

Part 1: Cause and effect

**Suppose you changed the tilt of the Earth, or moved it into a different orbit.
What effect would this have?**

- Study the list of changes; predict what effect each might have.
Match each change to one of the effects in the second list.
- Then, for each cause and effect, explain why the cause produces the effect.

List 1: Changes

You move the Earth into a circular orbit further from the Sun.
You straighten up the Earth, so that its axis is no longer tilted.
You make the Earth spin more slowly on its axis.
You move the Earth into an orbit which has an elliptical shape (like a squashed circle).
You tip the Earth so that its axis is more tilted.
You add extra carbon dioxide to the atmosphere.

List 2: Effects

There are bigger differences between the seasons – summer is hotter and winter is colder.
At some times of the year, the Earth is much hotter than at others.
During the daytime, temperatures rise higher; at night, they get much colder.
Average temperatures on the Earth are higher.
There are no longer any differences between the seasons.
Average temperatures on the Earth are lower.

Part 2: Consequences for life

How would life be affected if you changed the Earth and its orbit?

- For each of the effects above, decide how life on Earth would be affected.
Might life be wiped out? Would it be easier for life to continue – for example, would the North and South Poles become inhabitable?
- Now design a new planet – Planet 10. It must be suitable for life to inhabit it.
Decide on its important features – size, tilt, spin, orbit, atmosphere and so on.
- Make an illustration of your planet, give it a name, and add notes to explain why it will be a good home for life.





CHANGING THE EARTH- ACTIVITY SHEET 02

Answer to Part 1:

Change: You move the Earth into a circular orbit further from the Sun.

Effect: **Average temperatures on the Earth are lower.**

Change: You straighten up the Earth, so that its axis is no longer tilted.

Effect: **There are no longer any differences between the seasons.**

Change: You make the Earth spin more slowly on its axis.

Effect: **During the daytime, temperatures rise higher; at night, they get much colder.**

Change: You move the Earth into an orbit which has an elliptical shape (like a squashed circle).

Effect: **At some times of the year, the Earth is much hotter than at others.**

Change: You tip the Earth so that its axis is more tilted.

Effect: **There are bigger differences between the seasons – summer is hotter and winter is colder.**

Change: You add extra carbon dioxide to the atmosphere.

Effect: **Average temperatures on the Earth are higher.**





SOLAR SYSTEM QUIZ - QUESTIONS

Levels 01-03: Score 1 point for each correct answer

Levels 04-07: Score 2 points for each correct answer

Levels 08-10: Score 3 points for each correct answer

Best score = 60 points

Level 01: Easy starters

- What star is at the centre of the Solar System?
- Which planet is closest to the Sun?
- Which planet is the 'third rock from the Sun'?

Level 02: A little harder

- Which is the biggest planet?
- Which planet is famous for its rings?
- Which is the 'red planet'?

Level 03: Name it

- A rock orbiting the Sun, between Mars and Jupiter.
- The planet with the Great Red Spot.
- The hottest planet.

Level 04: Questions about distances

- Which is further from the Sun, Earth or Mars?
- The average distance of the Earth from the Sun is 1 AU. What does AU stand for?
- Which giant planet is about 5 AU from the Sun?

Level 05: Moons

- How many moons has the Earth?
- Which two planets have the most moons?
- Europa is a moon which might support life. Which vital substance does it have?





SOLAR SYSTEM QUIZ - QUESTIONS

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Levels 04-07: Score 2 points for each correct answer

Levels 08-10: Score 3 points for each correct answer

Best score = 60 points

Level 06: Comets

- What are comets made of?
- Which way does a comet's tail point?
- Planet's orbits are nearly circular. What shape is a comet's?

Level 07: Earth

- Which liquid on Earth is necessary for life?
- Name two gases produced by living organisms.
- If the Earth turned more slowly on its axis, how might we be affected?

Level 08: Seasons

- The Earth has seasons because its axis is tilted. What is the angle of its tilt?
- Which planet has a similar tilt, so that it has similar seasons?
- Does Mercury have seasons?

Level 09: Venus

- Why is it impossible to see Venus's surface from Earth?
- Which spacecraft mapped Venus's surface?
- Why is there no life on Venus?

Level 10: Mars

- Astronauts might visit Mars one day. Why would they need to take their own air?
- Where might astronauts look for water on Mars?
- Why does the Sun look smaller from Mars than from Earth?





SOLAR SYSTEM QUIZ - ANSWERS

Levels 01-03: Score 1 point for each correct answer

Levels 04-07: Score 2 points for each correct answer

Levels 08-10: Score 3 points for each correct answer

Best score = 60 points

Level 01: Easy starters

- The Sun
- Mercury
- Earth

Level 02: A little harder

- Jupiter
- Saturn
- Mars

Level 03: Name it

- Asteroid
- Jupiter
- Venus

Level 04: Questions about distances

- Mars
- Astronomical Unit
- Jupiter

Level 05: Moons

- 1
- Jupiter and Saturn
- Water (ice)





SOLAR SYSTEM QUIZ - ANSWERS

Levels 01-03: Score 1 point for each correct answer

Levels 04-07: Score 2 points for each correct answer

Levels 08-10: Score 3 points for each correct answer

Best score = 60 points

Level 06: Comets

- Dust and ice
- Away from the Sun
- Elliptical (squashed circle)

Level 07: Earth

- Water
- Oxygen, methane
- Longer days and longer nights; therefore bigger temperature differences between night and day.

Level 08: Seasons

- 23.5 degrees
- Mars
- No – zero tilt

Level 09: Venus

- Atmosphere is thick with clouds and carbon dioxide
- Magellan
- Too hot, no water, poisonous atmosphere

Level 10: Mars

- No oxygen in thin atmosphere
- In crater shadows, polar ice caps, deep underground
- It's further away.

