

Your Mission **MARS DIARY**

ACTIVITY 5.2 BIODOME GARDEN

From the Chapter Five of the Mission Mars Diary

marsdiary.org/activities/biodome-garden

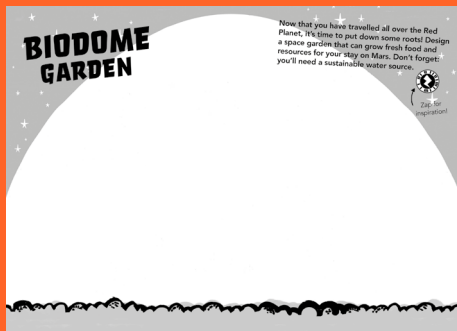
LEARNING LEVEL

KS2, P5-7, Y4-6

CURRICULUM LINKS & DIFFERENTIATION IDEAS

View detailed curriculum links for England, Scotland, Northern Ireland and Wales in the Teacher Toolkit, plus differentiation ideas for your region and year level.

marsdiary.org/resources/#teacher-toolkit



Resources Required

- Smartphone or device for Zap code (optional – see Useful Links)
- Seeds, soil, watering can, water etc

Background to this Activity

The ability to create renewable food sources beyond Earth is essential if humans are going to successfully colonise other planets. Issues like the lack of a readily available water supply and microgravity will need to be considered, so that plants can be grown in extraterrestrial environments.

Scientists are working with astronauts on the ISS to research the effect of plant growth in zero gravity and create a 'space garden'. This will help supplement astronauts' food supplies with nutrient rich foods and help develop resource-efficient ways of growing crops on other planets. This project has the added benefit of supporting astronauts' wellbeing, because of the psychological benefits which gardening provides.

Running the Activity

It may be useful to have a water cycle project running alongside this activity, for instance in another lesson, or one identified group could create a mini water cycle e.g. as in <https://principiaspacediary.org/activities/make-your-own-water-cycle/>

Research or identify the essential elements that a plant needs to grow – discuss the issues that a person would have on Mars, refer to Tim Peake's own project.

Also discover the list of best plants to grown in space.

Design a garden or mini garden that could grow on Mars either on paper or on a drawing application. Ensure that it is labelled. Also identify equipment, materials and/or machinery that would help a gardener on Mars to support his plans to thrive.

Questions for the Class

- Why do you think water is so essential to life?
- Can you explain the water cycle to a friend?
- What does a plant need in order to grow?

Additional Challenges / Extension Activities

Research or create recipes that incorporate your garden's produce.

Explore the EatWell Guide (see Useful Links) and ask students to design another Martian garden based on it and the volume of different food groups we need to eat each day.

Ideas for Differentiation

Lower:

- Design and plant a 'garden' in groups using seeds you provide. Challenge the children to maintain their garden over the coming weeks. Which gardens grow the most successfully and why? The children should maintain a log of what has been done to maintain their garden, identifying patterns of what happened in the most successful gardens.

Upper:

- Design a garden and decide how it will best grow in Mars. What considerations would students need to make in this harsh environment? How could they ensure that their plants received enough nutrients, light and water? Ask students to present their ideas to a friend, another group or to the whole class.
- 'Hot seat' a gardener on Mars, starting with writing a list of questions to research.

Useful Links

Zappar Content: Download or view the Zappar content for this activity on its webpage (URL to the left) or access

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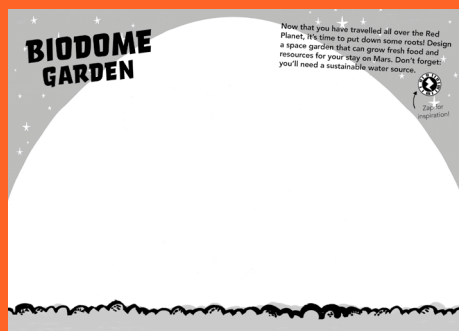
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it via the Zap.

EatWell Guide: <https://www.nhs.uk/Livewell/Goodfood/Pages/the-eatwell-guide.aspx>

Information about the top 10 space plants: <https://principiaspacediary.org/veg-in-space/>

Read the results of the Rocket Science project, in which Tim Peake took seeds to the ISS, so that schools could research if being in zero gravity effected how they grew: <https://schoolgardening.rhs.org.uk/Competitions/Rocket-Science>

ESA clip about space gardening, which includes images of how a future garden on Mars might look: <https://www.youtube.com/watch?v=RxlTZSEis4I>

NASA clip about space gardening: <https://www.youtube.com/watch?v=M7LslyCX7Jg>

Design a Space Dinner: <https://principiaspacediary.org/activities/eatwell-plates/>

ZAP! Students can independently access multimedia resources using the Zappar mobile/tablet app. See Zappar instructions at the link below and note that the mobile/tablet will need to be on a WIFI connection: marsdiary.org/resources/#teacher-toolkit

If you don't have access to the internet in the classroom, all Zap code content is available to download on the activity's web page (see link to the left) as a PowerPoint presentation or as bundles of images.



Find more great space-themed STEM resources at <https://www.stem.org.uk/esero>