

## *Pumzi* (dir. Wanuri Kahiu, 2010)

Lesson by James Chester, Teach First

Biology,  
Key Stage 3

*Pumzi* provides the starting point for students to discuss the importance of water to our planet. They are then guided to create a practical experiment that will allow them to understand what plants need to grow.

### Lesson Objectives

- Students identify what elements and conditions are needed for plants to grow. They will design an experiment naming the correct variables and describe what they are. They then evaluate

### Curriculum Links

#### KS3: Working Scientifically: Experimental Skills and Investigations

- Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
- Make predictions using scientific knowledge and understanding
- Predictions, including identifying independent, dependent and control variables, where appropriate
- Use appropriate techniques, apparatus, and materials during fieldwork and laboratory
- Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements

#### Leads on to **Biology: Nutrition and Digestion:**

- Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.

### You will need...

Still from film (provided)

Access to *Pumzi* via the BFI Player: [LINKLINKLINK](#)  
A3 pieces of plain paper for the think, pair, share activity

#### Simple apparatus set up:

Cress seeds (11/group)  
Water  
Sand  
Black card (to be used to simulate environment with poor/no light)  
Plastic cups (preferably transparent to simulate environment with poor air quality)  
Fertiliser or nutrients in some form.  
Petri dishes or small containers to place seeds and environment.

## Activities

### TRAILER: Dry, Dry Discussion

Show students the still from the film (provided below). Give each table/group these questions. You could either give them all to each group or have each group answer a different question. **Your aim is to lead the discussion towards the need for water.**

- What might this person be feeling?
- What could he/she be looking for?
- What is the weather like here?
- What would the Earth be like if it was covered in desert entirely?

### MAIN ATTRACTION: Plant Predictions Practical

Show the end of *Pumzi* (From 11.40). Here the main character sees a vision of a single tree after pushing herself to extremes searching in the desert. In the final scene, just before running completely out of energy, she manages to plant the seed she has been protecting on her journey, using what little remaining water she has.

Ask the question at the end:

**Do you think the plant will grow?**

- *Think, pair, share* this idea in each group – they can either write down their answers on A3 or just discuss their ideas. This should lead to a whole class discussion on why/why not they think the plant will grow.
- Brainstorm their ideas
- Introduce the apparatus and the aim of today's lesson.
- Each group should come up with a hypothesis using some of their prior knowledge of plants.

### Practical Set-up:

Six types of 'environment.'

Give the students some sand, water, some black card and two paper cups and ask

them to create the following environments using small petri dishes or containers:

1. Dry, sandy desert
2. Sandy desert with water underneath surface
3. Sandy desert with water underneath surface, but very little sunlight
4. Sandy desert with water underneath surface, but poor air quality
5. Sandy desert with water underneath surface and nutrient rich sand.
6. A 'control' of just the seeds in a container.

Students are asked to plant a cress seed in the six 'environments' (two sets in each, one has 10 seeds, the other only 1) in containers or petri dishes.

For the 'nutrient rich' environment, fertiliser could be added, or the sand could be mixed with compost.

The aim is that they return to their plants after a set amount of time (at least 24hrs, but preferably much longer). They are then asked to explain using their scientific knowledge and understanding (**after lessons on photosynthesis and respiration in plants in the mean time**) why each of the plants did/didn't grow.

### **END CREDITS: Results Review**

To be done during this lesson:

Ask the students:

Predictions: which do they think will grow the best and why?

Variables: what is changing?

What is being affected by these changes? What will be measured?

What will need to be kept the same to ensure this is a fair test?

**Evaluation** (after the experiment is completed. Leave at least 24hrs):

*For higher ability students:*

- Why did certain seeds grow better than others?

*For middle ability students:*

- Which environment allowed the seeds to grow best and why?
- Key words you could use in your answer: light, water, nutrients, respiration, photosynthesis, carbohydrates, energy, oxygen, carbon

dioxide.

*For weaker students:*

**Complete these sentences:**

The seed grew best in the \_\_\_ environment. From this experiment the things that a plant needs to grow are \_\_\_\_\_. The most important of these things is \_\_\_\_\_. Plants need these things for two processes - \_\_\_\_\_ and \_\_\_\_\_.

## Extras

### Other Ideas

The use of time-lapse photography would be an innovative way to explore the growth of the plants (or not) over time to the pupils. If the plants were left to develop for long enough, the sequence of pictures could be turned in to an effective display of the experiment by the students themselves.

Soil could be used instead of sand for the practical. Different sized dishes could be used to convey the importance of space as well, however this would work better with larger seeds.

You could explore the idea of environment or dystopia in lessons. Students could research how we manufacture drinking water and what may happen if we run out of water.

### Watch

*The Man Who Fell to Earth* (Nicolas Roeg, 1976)

*Soylent Green* (Richard Fleischer, 1973)

*District 9* (Neill Blomkamp, 2009)

*Pumzi* (Wanhuri Kahui, 2010, Inspired Minority)

