



## Beansprout feast

## Beanfeast

### Objectives

### New Words

### Resources

1. To appreciate the effect of light, air, water and temperature on plant growth [Sc2 3a]
2. To make systematic observations and measurements [Sc1 2f]
3. To make comparisons and identify simple patterns or associations in their own observations and measurements or other data [Sc1 2i]

*Nutrients, photosynthesis*

- Bag Gardens case studies
- Bean growing items
- Record Sheets
- Digital camera

### Intro and weigh

### Day 1

### Lesson 1

- Introduce pupils to the topic of plant growth and the pre-requisites for growth.
- Link to the topic of Bag Gardens and children's stories - growing food in Africa.
- Divide the class into groups, giving each group a particular type of bean. Get pupils to measure out a standard amount of beans/seed, such as 50 grams and measure the volume that they take up in the jar (alternatively, buy 'mixed beans for sprouting' and grow the seeds together).
- Follow the instructions on the following page. Prepare two jars without the knowledge of the pupils and place one in the fridge and have a small one that is full of seeds with no air pocket, and an airtight lid.

### Monitor

### Days 1 - 3

- Pupils observe and record the growth of their seeds using the **Record sheet**, making a mark on the side of their jar with a permanent pen to show the increase in volume at the start and end of each day.
- Emphasise the growth of the seeds through warmth, air and water – they will need light if you grow them for longer than four days (seeds also multiply their nutritional content many times during sprouting).

### Measure & Weigh

### Day 3

### Lesson 2

- The root growths can now be measured after three days. Groups can make measurements of ten sprouts (actually roots) and find the average length.
- Volume can be recorded on the side of the jars and entered onto the **Record sheet** as a change in height (h) in cm, or in actual volume using  $\pi r^2 h$ .
- Leave any types of bean that need an extra day - this group can help measure and record, perhaps on a whole class table on the board.
- Rinse, drain and weigh the roots.
- Then once a final rinse is made, the pupils can have a beanfeast tasting session – giving each type of bean a mark out of ten for taste and crunchiness (you could ask pupils to provide slices of bread/cheese/ham to make a sandwich).
- Explain that the beans are packed with protein, carbohydrate, fibre, vitamins and minerals – all needed for a healthy body.

## Results &amp; Conclusions

## Day 4

## Lesson 3

- Any beans left for a day are now measured. Using the **Record sheet**, pupils calculate the increase in weight and volume of the beans. This can be expressed: numerically, as a multiple and as a percentage. Graphs and charts of change over time can also be made from the results.
- Explain the importance of warmth, air, water and light on the growth of the seeds, asking pupils what they would expect if the seeds did not have these.
- Get out the two jars that had no warmth/water and a pack of dry seeds. Ask pupils what they observe and explain what has happened.
- Ask pupils to imagine what it would be like to grow their own food and explain that to get a good harvest, there needs to be the right conditions: light, warmth, water and good soil. The seeds have grown without soil so far, but to grow them into plants they would need soil with nutrients in it.
- Link back to the importance of a nutritious diet for children in both Africa and the UK. Remind pupils about the good harvest needed by Janvier's family and that the extra component for growth, good soil, is provided through the use of manure from the animals that Send a Cow provides.

## Extension ideas

- Make a wall display of growth-charts, results from the bean tasting and photos.
- Have a Harvest class assembly using photos of the bean growing, explaining what the class did and linking it to harvest, Janvier's story and growing healthy food.
- Grow other types of seeds (mustard, radish, wheat) and have a classroom area for growing, with table groups taking responsibility for it each week.
- Make a class bag garden, using the Send a Cow information sheets. Growth measurements and experiments can be made on plants in the bag.
- Grow some beans for longer, putting them on a windowsill and observing their leaf growth as they photosynthesise.

## Bean and seed facts

*These beans and seeds begin to need more light after about 4 days when they start to grow leaves. Before then, they are germinating, mainly using the nutrients in the bean/seed itself.*

**Lentils and Chick peas** need about 3-4 days to grow and are ready to eat at about 5-15mm.

**Sunflower seeds** need about 2-3 days to grow. They are ready when they have grown about 10mm. The sprout will taste bitter if left to develop green leaves.

**Aduki beans and Mung beans** need around 3-5 days to grow and prefer to be kept in a warm, dark place. They are ready when they have reached between 15-50mm.

## Bean growing

- 1 Soak 50 grams of beans overnight in cold water, in an 800ml jar. Strain the water off and re-cover with a square of muslin cloth.
- 2 Twice a day, gently rinse the beans around with cold water and drain off the water afterwards and re-cover. Leave the jar at a 45° angle on a tray.
- 3 Remove any mouldy seeds.
- 4 Observe the different growth rates of the beans over the 3-4 days, depending on the type of bean.
- 5 Rinse the beans in a colander to remove the hulls (seed shell).
- 6 Enjoy your crunchy harvest in a sandwich or salad!

I have been growing \_\_\_\_\_

Volume (cm or cm <sup>3</sup> )		
Dry beans/seeds = _____		
	Start of day	End of day
Day 1		
Day 2		
Day 3		
Day 4		

Weight of bean/seed (grams)		Difference in weight (grams)	As a multiple (eg. increased 8X)	As a percentage (% increase)
Before growing	After growing			
_____g	_____g	_____g	_____X	_____%

Volume of bean/seed (cm/cm <sup>3</sup> )		Difference in volume (cm/cm <sup>3</sup> )	As a multiple (e.g. increased 8X)	As a percentage (% increase)
Before growing	After growing			
_____	_____	_____	_____X	_____%

Average sprout length (mm)											Average length (Total divided by 10)
Sprout	1	2	3	4	5	6	7	8	9	10	
length (mm)											_____mm

Sprout eating results						
Sprout type						Best Sprout
Taste (out of 10)						
Crunch (out of 10)						