

3-5
years

pri-sci-net



inquire
investigate
evaluate
connect

Science Content:

Biological Sciences

Target Concepts/Skills:

Plants can grow in the dark and shade but it may affect the plant colour as is in the case of total darkness.

Target Age group:

Early years (3-5)

Duration of activity:

60 minutes for the first session, regular observations over a period of time, 30 minutes discussion of outcomes in the final activity.

Summary: In this activity, the children are presented with a powerpoint story based on 'Jack and the Beanstock'. Through this story, the children are presented with three hypotheses with respect to whether plants will grow well in the dark or other surrounding conditions. Based on the powerpoint story, the children then plant their seeds and decide in which conditions to place their seeds. The children will carry out regular observations over a number of weeks. Following these weeks of observation, the children will be given time to consider their observations and the evidence which they have gathered and to draw conclusions about the best conditions for plants to grow based on this evidence.

Objective:

By the end of the activity children should be able to:

- predict whether they think that plants need light to grow;
- observe and record what happens to plants if they are grown in darkness;
- use observations as evidence to draw conclusions about how plants grow in the dark.

Resources:

Powerpoint presentation (as separate document)

For each group of children:

- Vetch seeds – some dry and some wet
- Magnifying glasses
- Base of Plastic bottles (1½ or 2 litres) to act as pots
- Cotton wool
- Worksheet

To sow vetch seeds: Place the vetches in a large bowl and soak for at least 24 hours. The vetches will absorb a lot of water so make sure they have enough. Pack up the plastic containers with the cotton wool, saw dust or tissue paper. Water the vetches every few days making sure the cotton wool never goes dry.

Can plants grow in the dark?

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¹Based upon 'teaching science as inquiry' (Carin et al., 2005) ; 'Inquiry-based science instruction – What is it and does it matter?' (Minner et al., 2009) ; 'the psychology of teaching Scientific Thinking: implications for science teaching and learning. (Li, Klahr, 2006)

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Can plants grow in the dark?

Lesson plan

Lesson plan (with inclusion of teacher notes) - Description of activity

(10 minutes)

The teacher uses the powerpoint and tells the children the story of the three curious children and how their beanstalk grew and grew but not as fast as Jack's. There they met an enormous giant but this giant was a kind and friendly giant. The giant looked very sad. He told the children that he had a great problem because the plant he loved to eat had been stolen by a wicked fairy. "It grew in my dark shed but now it's gone" wept the giant. "We will try to solve your problem" said Tom. They searched and searched for this plant but could not see it growing anywhere in the Giant's garden. One night they crept into the fairy's cellar - it was in complete darkness and in the light of the candle they saw something gigantic in the background. "It looks like a massive plant - the Giant's favourite food!" says Tom. Indeed it was massive! The puppet addresses the children and questions them: "But how could a plant grow in the cellar? What do you think?"

(10 minutes)

Children in groups of 3 are presented with dry vetch seeds. They are allowed to examine the seed with a magnifying glass. The teacher asks the children to comment about their seed.

What shape does it have?
What does it feel like?
What colour is it?
What does it smell like?

The children are then presented with a wet seed and are asked the same questions as above. Again they examine both seeds and in groups discuss what they observe.

The worksheet will be distributed to the groups and each group will first discuss what they think is the ideal environment for a healthy plant and then fill up prediction sheet? The children will have to hypothesize whether plants will grow in the dark and if they grow what colour will the leaves be? Does it look like a healthy plant? The teacher asks the children to tick which seed (Kate/Wendy or Tom) they choose. The teacher then gives each group the role of one of the three children.

- Kate plants her seeds and places them in the light.
- Wendy plants her seeds and places them in the dark.
- Tom plants his seeds and places them in a shady corner in the room.

Each group of children plant their seeds in the same container with the same amount of cotton and water it with the same amount of water. One is placed in a closed carton box (dark), the other is left next to the window in light (light) and the other is placed on a shelf in the shade (shade).

On a weekly basis the groups will observe their plant and note the difference in colour and size. After a number of weeks, the children are given back their worksheet (depending on size) and discuss the observations made to draw conclusions on where the plants grows best - dark/light/or shade?

Can plants grow in the dark?

1. Engage (Forming hypotheses)

*Decide which question to investigate (= the challenge)
What do children already know? What are their ideas? (make the question to investigate meaningful for the children)*

The children are engaged in deciding which of the conditions of light will affect plant growth and in what way. The children will have the opportunity to predict and express their prior ideas

before carrying out the investigation.

The questions are presented in the powerpoint presentation and then children decide using the worksheet or some other way.

2. Inquiry (Designing and running experiments and observations)

Plan and conduct investigations in order to collect data

The children are posed with a problem and with different opinions – they have to decide which one they agree with and then to carry out an investigation which helps them gather evidence to draw conclusions about their inquiry.

There is data collection as they record the rate of plant growth in a simple way involving observation regularly every week.

3. Evaluation (Evaluating evidence)

Conclusion: use data to construct knowledge and generate evidence.

Demonstrate understanding of concepts and/or ability to use inquiry skills

Once the children have the observations with how the plants grew, then they can use this evidence to draw conclusions about the best conditions for plants to grow.

Children will have time to communicate and discuss both at the beginning at prediction stage of the inquiry, as well as at the end where the children have to draw conclusions.

Materials in attachment:

- Powerpoint presentation used;
- Worksheet (attached)

Can plants grow in the dark?



Do plants grow in the dark?



Kate's plant in the light

Yes

No

The colour of leaves



Wendy's plant in the dark

Yes

No

The colour of leaves



Tom's plant in the shade

Yes

No

The colour of leaves