Conditions necessary for germination of seeds

Biology | Plant Physiology / Botany | Germination, growth, development

Difficulty level	Group size	Preparation time	Execution time
medium	2	10 minutes	40 minutes

This content can also be found online at:

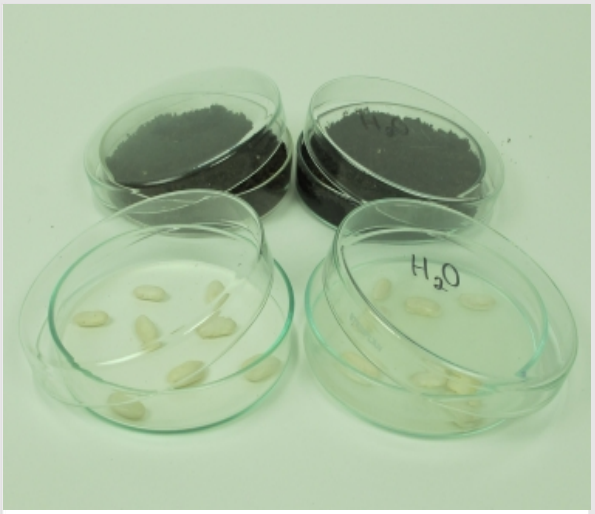
http://localhost:1337/c/5f0d6c591c41060003916b68

PHYWE

Teacher information

Application

PHYWE



Experimental setup

Everyone who likes recreational gardening has asked this question at least once: What factors influence seeds in their germination? This experiment provides answers using pea seeds or beans.

PHYWE

Robert-Bosch-Breite 10
37079 Göttingen

Tel.: 0551 604 - 0
Fax: 0551 604 - 107

info@phywe.de
www.phywe.de

Other teacher information (1/2)

PHYWE

Prior knowledge

Germination refers to the development of the seed of seed plants. This includes the whole process of development, starting with the swelling of the seeds and the growth of the embryo in the fertile seeds, via the formation of the radicle up to the complete formation of the seedling.

Scientific principle

This experiment underlies the common principles of plant germination

The garden soil needs to be completely dry for this experiment. Spread it out on a sheet of paper and let it dry until it can be crumbled to dusty particles before starting this experiment.

In order to achieve reasonable results, the experiment should be carried for at least 6 days.

Other teacher information (2/2)

PHYWE

Learning objective

In this experiment the students are supposed to explore which conditions influence the germination of seeds.

Tasks

The students observe the seeds under different conditions and are supposed to examine how these factors influence the germination.

PHYWE

Robert-Bosch-Breite 10
37079 Göttingen

Tel.: 0551 604 - 0
Fax: 0551 604 - 107

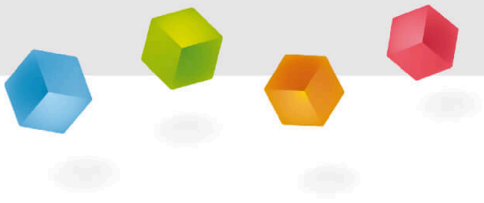
info@phywe.de
www.phywe.de

Safety instructions

PHYWE

The common rules of safe experimentation in scientific education to be applied to in this experiment.

PHYWE



Student information

PHYWE

Robert-Bosch-Breite 10
37079 Göttingen

Tel.: 0551 604 - 0
Fax: 0551 604 - 107

info@phywe.de
www.phywe.de

Motivation

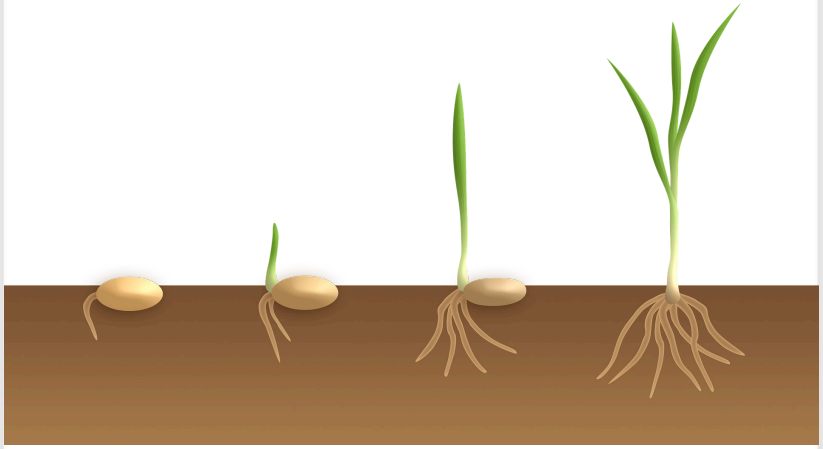
PHYWE

Seedling

Why do seeds only sprout in soil and not already in the paper bag at your local store? Even when they are planted in soil some of them sprout and others don't. The following experiment wants to answer this question.

Tasks

PHYWE



Schematic representation of germination

Examine under which conditions the germination of seeds occurs.

PHYWE

Robert-Bosch-Breite 10
37079 Göttingen

Tel.: 0551 604 - 0
Fax: 0551 604 - 107

info@phywe.de
www.phywe.de

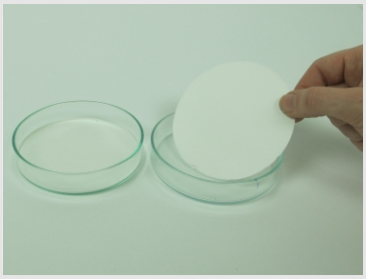
Equipment

Position	Material	Item No.	Quantity
1	Circular filter,d 90 mm,100 pcs	32977-03	1
2	Beaker, 250 ml, plastic (PP)	36082-00	1
3	Laboratory pen, waterproof, black	38711-00	1
4	Spoon, with spatula end, 180 mm, plastic	38833-00	1
5	Petri dish, d 100 mm	64705-00	4

PHYWE
Robert-Bosch-Breite 10
37079 Göttingen
Tel.: 0551 604 - 0
Fax: 0551 604 - 107
info@phywe.de
www.phywe.de

Setup (1/3)

PHYWE



Fill two 100 mm diameter Petri dishes with dry garden soil to a depth of 1 cm. It is essential that the garden soil is completely dry.

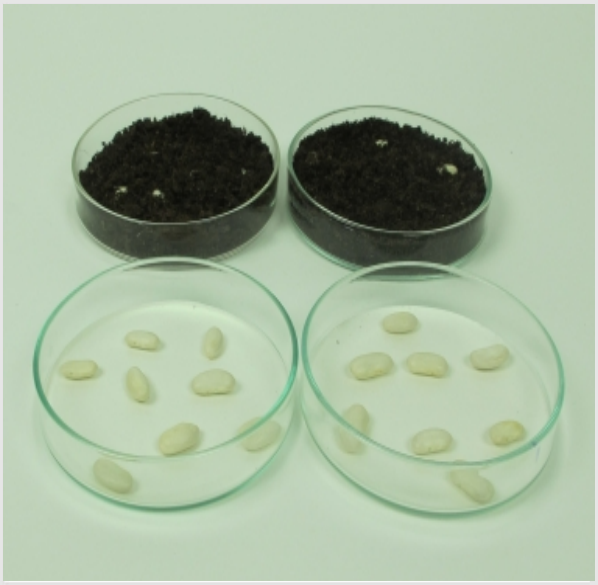
In each of two other 100 mm diameter Petri dishes place three circular filters of 90 mm diameter and smooth them out on the bottom of the dishes.

Setup (2/3)

PHYWE

Place 5 to 8 dry bean or pea seeds into each of the four Petri dishes. In the dishes containing garden soil the seeds should just peep out of the soil.

Pour just enough water to cover the seeds into one of the dishes with the circular filters.



PHYWE

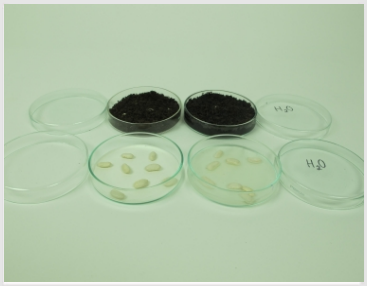
Robert-Bosch-Breite 10
37079 Göttingen

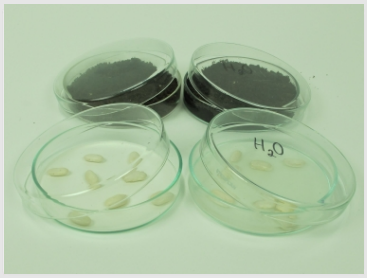
Tel.: 0551 604 - 0
Fax: 0551 604 - 107

info@phywe.de
www.phywe.de

Setup (3/3)

PHYWE

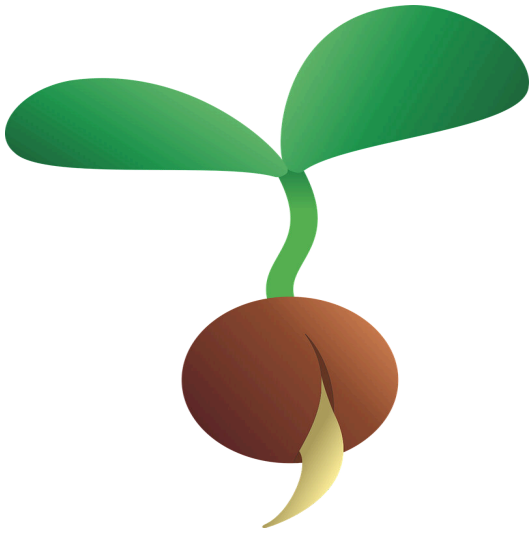




Into one of the two dishes containing soil carefully pour just enough water for the soil to be moistened well and evenly.

Label the dishes so that you know which dishes need to be kept moist. Place the lids slantingly on the dishes so that the water does not evaporate too quickly from the dishes which have been kept moist and that air can enter all the dishes at the same time.

Procedure



Control the seeds daily over a period of at least 6 days. What changes can you notice? Water the seeds lying on wet circular filters or moist garden soil regularly. The circular filters and the garden soil should be kept moist, but not too wet.

PHYWE

Robert-Bosch-Breite 10
37079 Göttingen

Tel.: 0551 604 - 0
Fax: 0551 604 - 107

info@phywe.de
www.phywe.de

Report

Task 1

Components of the plant

stem

root

leaf

seed capsule

Check

PHYWE
Robert-Bosch-Breite 10
37079 Göttingen
Tel.: 0551 604 - 0
Fax: 0551 604 - 107
info@phywe.de
www.phywe.de

Task 2

PHYWE

What is needed for the germination to occur?

- [ ] Water
- [ ] Air
- [ ] Soil
- [ ] Light

Check

Task 3

PHYWE

What fixes the plant in the soil?

- The blossom
- The leaf
- The root
- The stem

PHYWE

Robert-Bosch-Breite 10
37079 Göttingen

Tel.: 0551 604 - 0
Fax: 0551 604 - 107

info@phywe.de
www.phywe.de

Slide	Score / Total
Slide 15: Components of the plant	0/4
Slide 16: Germination of seeds	0/3
Slide 17: Pick the right answer	0/1

Total Score 0 / 8

Show solutions Retry

PHYWE
Robert-Bosch-Breite 10
37079 Göttingen
Tel.: 0551 604 - 0
Fax: 0551 604 - 107
info@phywe.de
www.phywe.de