

## CD Greenhouse

**Category:** Biology: Plants

**Type:** Make and Take

**Rough Parts List:**

1	CD case
1-2	Paper towels
	Seeds
	Water container

**How To:**



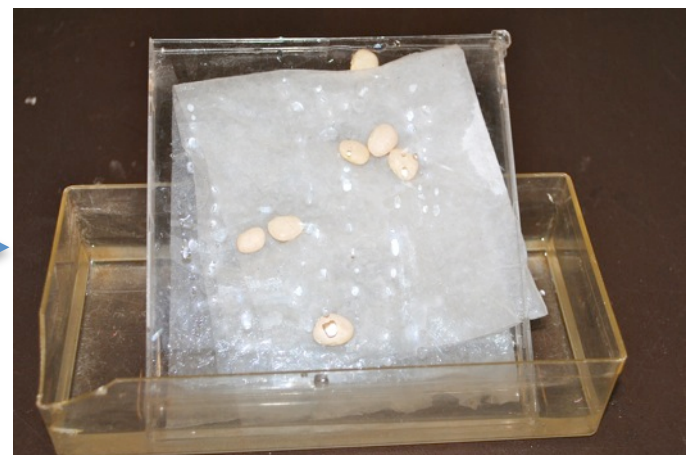
Empty a CD case.



Open the case and place a paper towel inside.



Place 4-5 seeds or beans on top of the paper towel and close the CD case.



Sit the CD case in a container of water.



Place the greenhouse in sunlight, keep it watered, and watch your seeds grow!

### **Fine Points:**

- Begin with growing a hardy species such as peas or beans.
- Be sure the bottom of the paper towel touches the water in the water basin so that it can continually soak up water.
- Place the greenhouse in a warm and sunny spot.
- Remember to check the water level every couple of days—without water the seeds will not germinate and the plant cannot survive.

### **Concepts Involved:**

- All living things need food, water, air and a place to live
- Habitat
- Germination
- Plant anatomy

### **Elaboration:**

A habitat is the environment where a plant or animal can get the food, water, shelter and space it needs to survive and live. In this project, a CD case becomes a habitat for a germinating seed.

Plants are different from animals because they can make their own food but cannot move on their own. To adapt to living life in one place, plants have developed specialized parts including roots, leaves, stems, and seeds to help them survive. Roots support a plant by anchoring the plant and absorbing the nutrients and water it needs to grow. Stems carry the water and nutrients taken up by the roots to the leaves, which contain the green pigment chlorophyll. Chlorophyll absorbs the sun's energy and helps the process of photosynthesis in which plants make their own food using the sun's energy.

Flowers are important to plant reproduction because they develop new seeds after they have been pollinated. Seeds are tiny plants with leaves, stems, and root parts; fruits are formed from flower parts to protect the seeds that are inside of them. When conditions are right, the seeds will spread from their parent plant. Many seeds will land in environments that are not right for them, but a few lucky seeds will land in a habitat that is perfect for them to germinate and grow.

Germination is the process in which a plant emerges from a seed and begins to grow. Seeds will not germinate until they are living in the perfect combination of water, oxygen, temperature, and light. To increase the chances of germination in the CD greenhouse, remember to check the water level in the water reservoir, make sure the paper towels are always damp, and the greenhouse is kept in a warm and sunny spot.

In this activity it is important to address the *common misconception that soil and water are the sources of new plant matter*. Through photosynthesis, plants use the sun's energy to change the carbon dioxide in air into sugars. Some of these sugars are used to create plant matter as the plant grows from a seed into a full grown plant.

### **Links to k-12 California Content Standards:**

#### Grades k-8 Standard Set Investigation and Experimentation

Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other strands, students should develop their own questions and perform investigations.

#### Grades k-12 Mathematical Reasoning:

1.0 Students make decisions about how to approach problems:

1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.

1.2 Determine when and how to break a problem into simpler parts.

2.0 Students use strategies, skills, and concepts in finding solutions:

2.1 Use estimation to verify the reasonableness of calculated results.

2.2 Apply strategies and results from simpler problems to more complex problems.

2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

2.5 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

3.0 Students move beyond a particular problem by generalizing to other situations:

3.1 Evaluate the reasonableness of the solution in the context of the original situation.

3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.

3.3 Develop generalizations of the results obtained and apply them in other circumstances.

Grade Kindergarten Standard Set 2. Life Sciences

2.c. Students know how to identify major structures of common plants and animals (e.g. stems, leaves, roots, arms, wings, legs).

Grade 1 Standard Set 2. Life Sciences

2.b. Students know both plants and animals need water, animals need food, and plants need light.

2.e. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.

Grade 2 Standard Set 2. Life Sciences

2.e. Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.

Grade 3 Standard Set 1. Physical Sciences

1.a. Students know energy comes from the Sun to Earth in the form of light.

Grade 3 Standard Set 2. Physical Sciences (Light)

Light has a source and travels in a direction.

2.a Students know sunlight can be blocked to create shadows.

Grade 5 Standard Set 2. Life Sciences

2.f. Students know plants use carbon dioxide (CO<sub>2</sub>) and energy from sunlight to build molecules of sugar and release oxygen.