

# Pop Bottle Hydroponics

## TEACHER RESOURCES

### ANSWER KEY (Out of 30 points)

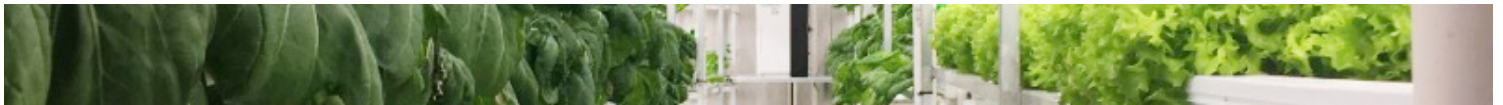
1. Explain what “hydroponics” means. **4**  
Hydroponics grows plants with no soil.
2. Plant need nutrients to grow and what else? **6**  
-water, warmth, light, support, oxygen and carbon dioxide
3. Where does coir come from? **2**  
Coir comes from the middle (fibrous) coat of a coconut
4. Name 3 reasons coir is used for growing plants. **3**  
- is very rot-resistant  
- helps keeps air in the soil  
-absorbs a lot of water (30% more than peat moss)
5. List the three macro-nutrients needed by plants. **3**  
- nitrogen  
- phosphate  
- potassium (or potash)



6. Name four reasons for using hydroponics? **4**  
weather is not an issue / food can be grown anywhere / plants grow faster / it uses less water / more food is needed.

### Fill In The Blanks **8**

7. When sprouting seeds, **warmth** is more important than light.
8. It is important that the area around the seed is kept **moist** for the first couple of days.
9. Mix the nutrient solution **twice** a day to keep the nutrients from settling.
10. Replace nutrient water solution totally every **two weeks** to avoid the risk of **algae/bacteria** growth.
11. Help stop algae growth in the nutrient solution by wrapping the bottle in **aluminum foil**.
12. Capillary action is when a liquid flows in **narrow spaces** without any help and even goes against **gravity**.



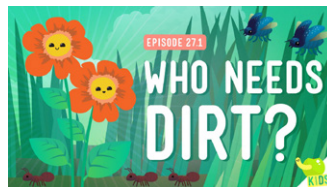
### More Challenges

Set up experiments to test any of the following  
*Remember to state a hypothesis, plan your procedures, include a control and take good records of your observations.*

- Rate of plant growth in nutrient rich solutions versus nutrient poor solutions in a hydroponic system.
  - Hint: plant seeds in identical hydroponics containers. Give half of the plants nutrient enriched water and the other half pure water.
- Rate of plant growth in traditional (nutrient rich) soil versus a hydroponics system.

### More Videos

Who Needs Dirt? - Crash Course Kids  
<https://www.youtube.com/watch?v=eCSlrlkOGTs>



Video: Hydroponic farming looks to offer food stability across Canada - CBC

<https://www.youtube.com/watch?v=GjCDQgJrCMo>



Be sure to visit [www.3NE.ca](http://www.3NE.ca)

- **Sustainable Food Centre Project:**  
<https://www.3ne.ca/community-projects/sustainable-food-centre/>
- **News about the Growcer Hydroponics Unit:**  
<https://www.3ne.ca/news/>
- **Check out the Learning Resources:**  
<https://www.3ne.ca/learning-resources/>
- **Share job opportunities with your students:**  
<https://www.3ne.ca/jobs-more/>



## Alberta Curriculum Connections

	Subject	Curriculum Connection	Detail
4	Science	Plant Growth and Changes	-Recognize that plant requirements for growth -Nurture a plant through one complete life cycle—from seed to seed -Describe the care and growth of a plant that students have nurtured
		Waste in Our World	-identify materials that can be reused or recycled -Identify alternative materials and processes that may decrease the amount of waste produced
5	Science	Topic E: Wetland Ecosystems	<i>Experience with close observation of plant growth will aid in the general understanding of concepts in this unit.</i> Understand interactions between living and nonliving things, both in and around water. Identify the roles of producers—green plants that make their own food, using sunlight.
6	Science	Topic E: Trees and Forests	<i>Experience with close observation of plant growth will aid in the general understanding of concepts in this unit.</i> Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things.  Describe the role of trees in nutrient cycles and in the production of oxygen.