

# Activity 16

# Conditioned Soil

by Michelle Pleich

## Study Question:

How does the soil and weather affect crop production?

## Activity:

Students will plant a variety of grain seeds in different soils. The grains will be exposed to a variety of weather conditions relevant in farming today.

## Curriculum Fit:

### Grade Four - Language Arts

- Learn and define appropriate agricultural terminology.

### Grade Four - Mathematics

- Graphing.

### Grade Four - Science

- Classify living things and predict/test hypotheses.

## Agricultural Concepts:

Importance of soil and water.

## Purpose:

- To demonstrate that soil types as well as weather conditions affect crops.
- To develop an awareness of the challenges involved in grain farming.

## Materials Required:

- various types of grain (see resources)
- various types of soil from different areas
- milk cartons (one for each student)
- sunlight source (window or “grow” lamp)
- water

## Time Required:

Three class periods and ten minutes once a week for approximately four months.

# Background — For the Teacher

What could be more wonderful than sitting down at supper to enjoy a juicy, tender steak with a fresh garden salad, hot baked bread, completed with an icy cold glass of milk? As we savor our mealtime moments, do we ever consider how important the agricultural industry is to us. The meals we typically consume every day would not be available if it weren't for the challenging and risky business of farming.

This lesson focuses on the types of grains produced by the agriculture industry that we use in our consumed food items and looks at how weather and soil determine the quality and availability of the food we eat.

Students will learn to appreciate the difficulties of growing grain crops as well as the rewards.

## Procedure

### Preparation

1. Display the variety of seeds for the children to see, compare and identify.

### Introduction

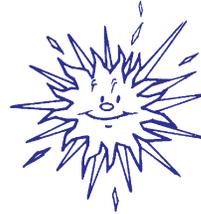
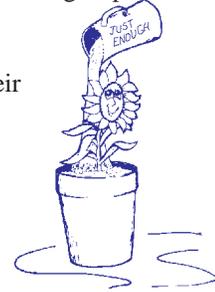
2. Define and discuss irrigation, drought and flooding (Dictionaries would be useful).



## Activity

3. Give each child a milk carton with the tops cut off. Fill each with a different type of soil. Divide the seeds among the children so that they have about six seeds of the same grain in each variety.
4. Divide the students in three groups:

- a) *Control group* - These children will water their grain as needed.



- b) *Drought group* - This group's plant will be watered once a week.

- c) *Flooding group* - This group will water their crop as needed as well as overflow the amount of water once a month.



Each group should have a similar variety of grain and soil (contact your local UGG or UFA for samples). Label the types of grain and soil of each plant. Remember the crops need lots of sunlight to grow.

5. Brainstorm predictions about what the outcome of the experiment will be. Write this information on a chart and display in classroom.
6. Hand out graphs to record plant growth and color (see resources). For example, explain that once a week the class will record the height (in centimeters) as well as the color of the grain as it grows.

## Conclusion

7. After about six weeks compare predictions with actual outcome. Discuss the role weather and soil play in producing crops. What are the best weather and soil conditions for growing wheat?

## Discussion Questions

1. What types of consumer goods are made from the different types of grain?
2. What might happen if all three weather conditions occurred in the four months of grain growth?
3. What can farmers do when one of these weather conditions occurs?
4. What might happen if no crops grew due to droughts or flooding conditions?

## Evaluation Strategy

1. The completeness, accuracy and neatness of the reports, graphs and charts.
2. Participation in and understanding of the scientific process.

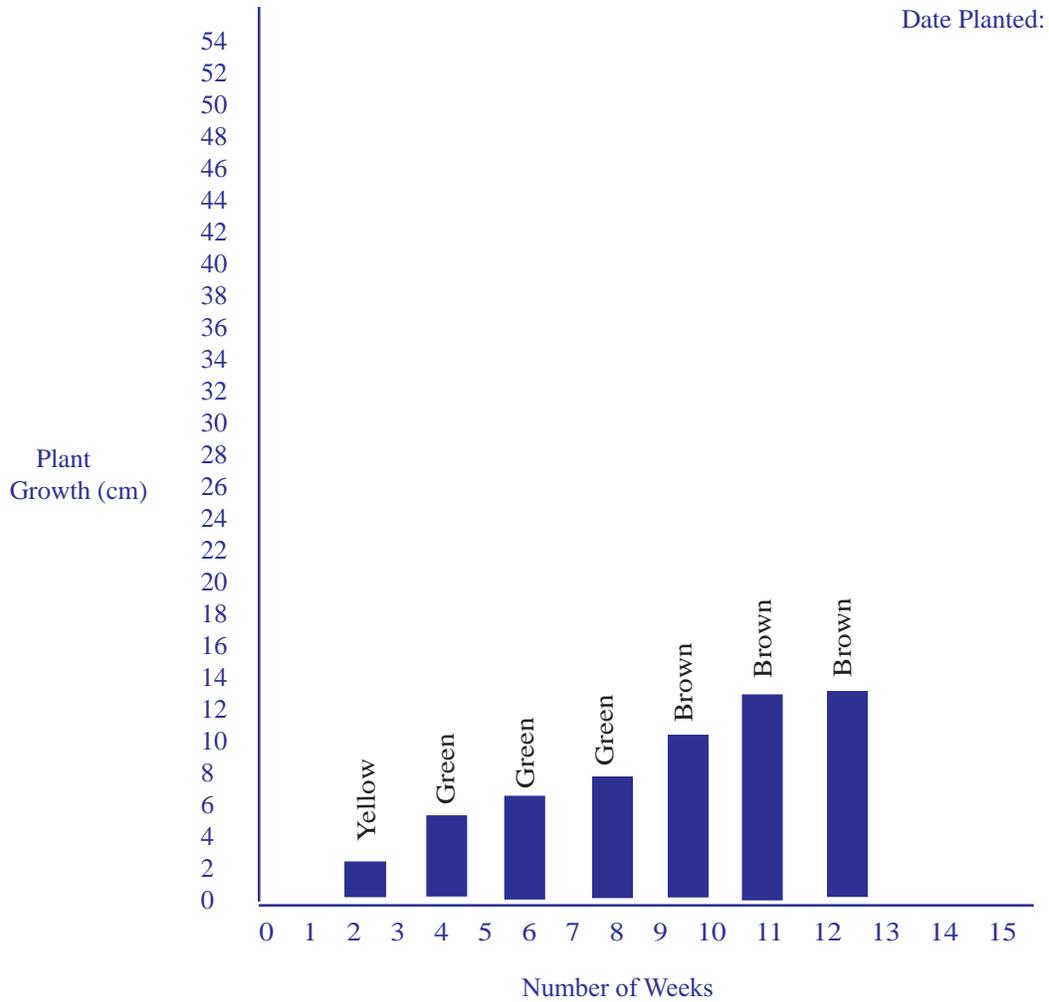
## Related Activities

1. The students can think of creative ways to supply water to drought crops or remove too much water in the case of flooding.
2. Draw pictures depicting different stages of growth, i.e. each week.
3. Invite someone from Alberta Pool to come to the class and discuss the different grains and how weather and soil affects crops. You can also take a field trip to Alberta Pool to see how they operate.
4. Look at the different types of fully developed grain. Compare and contrast physical features of the grain as a whole and the different seeds produced. Brainstorm food items which are produced by the different types of grain.
5. Bake goods out of a variety of grains. (see Teacher/Student for possible recipes)

## Resources

Alberta Pool will provide your class with grain seeds. Contact **Ag in the Classroom** at **427-2171** for a list of Alberta Pool outlets. Find the address and phone number nearest you. Also the students can collect soil from a variety of areas: farms, home, school yard, plant shop or from any other area that soil can be found.

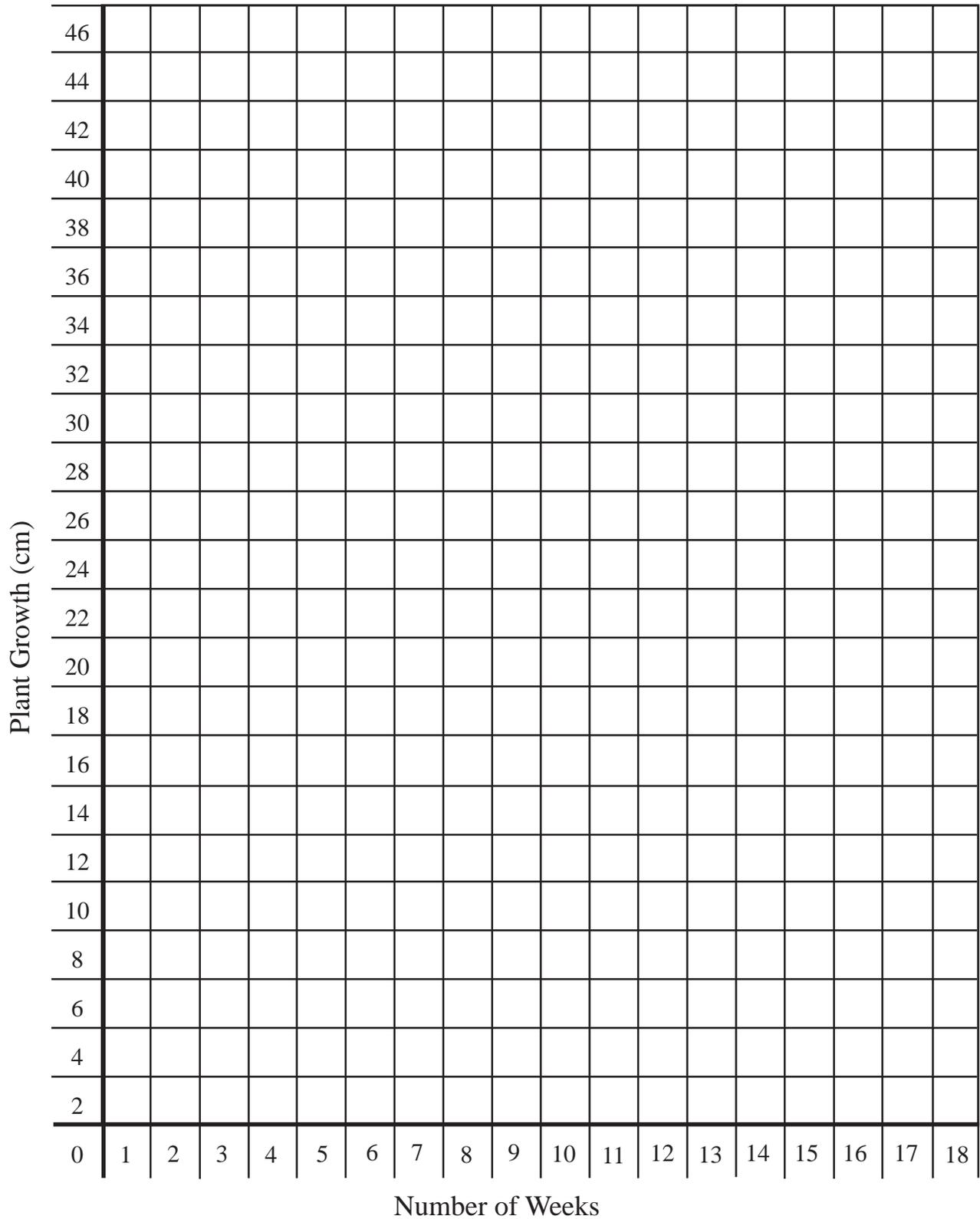
# Plant Growth Chart



\*\* This is only an example chart. Each plant will grow at a different rate and will pass through a different colour stage as it grows. The student will record the growth (in cm) every two weeks as well as label the color of the plant.

( A second blank graph to be distributed to the students by the teacher )

# Plant Growth Chart



## Recipes

### PANCAKES OR GRIDDLECAKES

Yield: 6-8 medium

250 mL flour  
10 mL baking powder  
1 mL salt  
30 mL sugar  
250 mL milk  
1 egg, beaten  
30 mL vegetable oil

1. Sift dry ingredients together in a large bowl; make a well in the dry ingredients.
2. Combine milk, beaten egg and oil in a small bowl.
3. Add liquid ingredients gradually to dry ingredients to prevent lumps forming. Stir; do not beat.
4. Drop batter by 50 mL measures onto a preheated griddle or frying pan. When bubbles begin to break on the surface the pancakes may be flipped; cook until golden brown.

### PLAIN MUFFINS

Yield: 12 medium

500 mL flour  
10 mL baking powder  
60 mL sugar  
2 mL salt  
250 mL milk  
1 egg, beaten  
60 mL vegetable oil  
2 mL vanilla (optional)

1. Sift dry ingredients into a large bowl; make a well in the dry ingredients.
2. Combine milk, beaten eggs, oil and vanilla, if desired, in a small bowl.
3. Add liquid ingredients all at once to the dry ingredients. Stir only until the dry ingredients are just dampened. The batter will be slightly lumpy.
4. Place batter in greased or paper-lined muffin tins filling 2/3 full.
5. Bake at 200 C for 20-25 minutes.

### SUGAR COOKIES

Yield: 4 dozen

500 mL flour  
2 mL salt  
10 mL baking powder  
175 mL shortening, softened  
175 mL sugar  
2 eggs  
5 mL vanilla

1. Sift flour and measure. Resift with salt and baking powder.
2. Cream shortening and sugar together.
3. Add unbeaten eggs, one at a time, and beat.
4. Add dry ingredients and the vanilla. Roll (chill first) and cut with a cookie-cutter, or form into small balls and press down with a lightly floured glass.
5. Place on a greased cookie sheet. Bake at 190 C for 10-12 minutes.

# Diagram of Wheat

