# Lesson Plan: Collecting Data: Oh Deer!

**Subject:** Math  
**Grade:** 7

**Strand:** Data Management  
**Time:** 90 minutes

<table>
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<th>Desired Results</th>
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## Lesson Description

In this lesson, students will participate in an experiential data-collecting activity. In the first part of this lesson, students will portray deer and habitat components in a physical activity and record how certain factors affect their population. In the second part of this lesson, students will graph the changes in deer population through a line graph and then analyze their graphs by answering a series of questions.

## Ontario Curricular Overall Expectations

- Collect and organize categorical, discrete, or continuous primary data and display the data using charts and graphs;
- Make and evaluate convincing arguments, based on the analysis of data.

## Ontario Curricular Specific Expectations

### Collection and Organization of Data:

- Collect and organize primary data from *Oh Deer!* and display data in graphs with appropriate titles, labels, data points and scales that suit the range and distribution of the data;
- Understand and justify why a line graph best represents *Oh Deer!* data.

### Data Relationships:

- Read, interpret and draw conclusions from primary data;
- Make inferences and convincing arguments that are based on the analysis of graphs.

## Lesson Goals

- Students will participate in *Oh Deer!* game to collect data.
- Students will be able to graph deer population changes over time.
- Students will be able to analyze the meaning of the graph.
- Students will be able to infer reasons why deer populations may change.

**Success Criteria**

- I can collect data by playing *Oh Deer!* and represent it in a line graph.
- I can analyze that data to understand why deer populations change.
- I can use a graph to understand relationships in the real world.

**Key Vocabulary:**
Horizontal axis, vertical axis, mean, data, census, sample.

**Assessment**

Assessment Mode: oral/ performance/ written

Assessment Strategy:

- *Performance:* Students will be assessed according to their participation in *Oh Deer!*
- *Written:* Students will also be assessed by their *Oh Deer! Worksheet*
- Generally, students will be assessed through observation during all parts of the lesson (especially during the consolidating activity to ensure low math anxiety and grasping of concepts).

Assessment Tool:

- *Oh Deer! Worksheet* (see attached)

**Materials**

- Portable white/black board and marker.
- Graphing Paper
- Oh Deer! Student Response Sheets (photocopied)
- Computer and projector
- *Collecting Data* slide show: This slide show included photos of a bar graph created on a birthday cake with raisins and icing, another bar graph that was created by knitting it, and a pie graph showing peoples most common responses to when their friends tell them that their breath stinks.

**Lesson Format : What Teachers Do/Say**

**Motivational Hook/engagement /introduction (5-10 min) Minds on**

- Informal KWL: *What is data? How do we display data?*
Show different ways data can be visualized (Collecting Data slide show) and explain the role of graphs. Use images to initiate student interest and demonstrate the humour behind some graphs.

Brainstorm practical ways collecting data may be useful in everyday life.

Discuss: What is the difference between data in a census versus a sample?

Explain the upcoming activity and how students will participate in it to gather data through sampling.

Prepare students to go outside.

Sit down in a circle and begin explaining activity.

During /working on it/action:

1. Mark two parallel lines on the ground 10 to 20 yards apart. Ask students to count off in fours. The ones become the “deer” and line up behind one line with their backs to the other students. The other students become habitat components necessary to survive (food, water, and shelter) and line up behind the other line with their backs to the “deer”.

2. Explain that the deer need to find food, water, and shelter in order to survive in their environment. If they do not then they will die.

3. In this activity when the “deer” is looking for food, it should clamp its hands over its stomach. When a “deer” is looking for water, it should put its hand over its mouth. When a “deer” is looking for shelter, it holds its hands together over its head.

4. A “deer” can choose to look for any one of its needs during each round of the activity. Emphasize that the “deer” cannot change what it is looking for during a round. It can only change what it is looking for at the beginning of each round.

5. The other students are the food, water, and shelter. Students get to choose what they want to be at the beginning of the round. They show their choice in the same way as the “deer” have. Emphasize to these students that they cannot change what component they are during a round. They can only change at the beginning of each round.

6. The teacher should begin the first round by asking all students to make their signs—hand over stomach, mouth, or head. Emphasize that students should choose one of these symbols before turning around to face the other group.

7. When the students are ready tell them to “GO!”. At this time each “deer” and each “habitat component” turns to face the opposite group continuing to hold their sign clearly.

8. When the “deer” see the “habitat component” that matches what they need, they are to run to it. Each “deer” must hold the sign of what it is looking for until getting to the matching “habitat component.”

9. Once the “deer” find their correct component they should take it back to their line, and the “habitat component” becomes a “deer”. Any “deer” who fails to find its “habitat component” dies becomes a “habitat component” on the other side and becomes available as food, water, or shelter to the “deer” who are still alive.

10. “Habitat components” not taken by a “deer” continue to be “habitat components”.

11. The activity should consist of 12-15 rounds. The teacher records the number of “deer” at the beginning of the activity and at the end of each round so that
students can graph the results in the classroom.

Part Two:

1. Return to the classroom and as students as settling post the data on the black board for all students to see. The number of deer at the beginning of the activity and at the end of each round represents the number of deer in a series of years. That is, the beginning of the activity is year one; each round is an additional year. Ask a couple students to hand out an *Oh Deer! Worksheet* to each student.

2. Discuss the activity and encourage students to talk about what they experienced and saw. For example, they saw a small herd of deer (7 students in a class size of 28) begin by finding more than enough of its habitat needs. However, because the population of deer expanded over two to three rounds of the activity until it exceeded the carrying capacity of the habitat, there was not sufficient food, water, and shelter for all members of the herd. At that point, deer starved or died of thirst or lack of shelter, and they returned as part of the habitat. Such things happen in nature also.

3. Review the role and purpose of data collection.

4. Review the steps in making a line graph.

5. Allow students to work on work sheets and monitor the classroom as they work.

After: Consolidation : Reflect and Connect (10 min)

Review/graph the activity with students and discuss the realistic-ness of this simulation. Discuss the weaknesses in line graphs. Allow students to complete the attached worksheet next period or at home.

Or

Tell a tree-planting story. This class enjoys hearing wilderness stories.

Extension Activities/Next Steps

In my circumstance, we are planning to use a computer graphing program to display the data in a variety of 2D graphs and charts. Encourage the students to experiment with their scales to change the representation of their data. This will lead to a 3rd lesson on the misrepresentation or bias of data in graphs.

Other possible extension activities are, but not limited to:

- Use a search engine or online dictionary to research the key terms used in the activity (“habitat”, “carrying capacity”, etc.).
- Use a calculator to determine the area of the game field. Compare space available per deer for each round.
- Use GIS (Geographic Information System) data to compare healthy deer habitat to areas changed by development.
- Use the Internet to research specific deer habitat requirements.

**Special Education Notes**: Differentiated Instruction considerations/accommodations/assessment

- Assign certain students to work together to encourage peer-tutoring among friends. This is especially applicable in this class where it is divided into mixed-ability groups.

Students with mobility issues can:

1. Record the number of remaining deer after each round on the white board;
2. Announce “Go!” when the students are ready.
3. Provide scenarios that may affect deer population.

**Cross Curricular Links**: Oral, reading, Writing, Media, Social Studies, Science, Math, Visual Arts, Drama, Music, PE&H, (circle)

  Specific Expectations: Relating science and technology to society and the environment.

- Physical Education:
  A 1.1: Actively participate in a wide variety of program activities, according to their capabilities;
  A 2.1: Daily physical activity (DPA): participate in sustained moderate to vigorous physical activity.

**Lesson Reflection: Teacher and Lesson**

**Associate Teacher Reflection:**

- Avoid using open-ended questioning at the beginning of the lesson. Try a collaborative learning approach to give students time to digest your questioning (i.e. What is data? How is data displayed?). This will allow students time to better relate to lesson content and especially encourage exceptional students.
- Great game! The students had a lot of fun and were also very focused when coming back inside.
- How well do you know how students performed at creating their own graphs? Did you monitor them well enough? Will you address any issues they had when
constructing a graph?

Self-Reflection:

- I was very pleased with the lesson. The students were very engaged and excited to integrate their DPA with math.
- I decided to explain the game inside to ensure they remained concentrated and knew how to play Oh Deer! before we went outside. This proved very successful!
- I need to brainstorm ways to better engage students at the beginning of a lesson rather than relying on questioning. The same students respond and many others don’t really engage with the questions.
- Time-management-wise, this lesson went very well. There was enough time for about half of the class to complete their worksheets, as I expected and I was able to assign further work for those who finished early.
- I found that by walking around the class and monitoring the students as they worked collaboratively or individually (by choice), I was best able to help those who needed the most help. Also, by encouraging students to work together and then later questioning the struggling students, I learned that such collaborative learning really helped.
- I ended up collecting the Oh Deer! worksheets to assess student comprehension of how to construct a graph. I also marked the booklets and left the remaining with my associate to mark.
- In the last “year” of the Oh Deer! game, I secretly instructed all the “habitat components” to dance Gangnam Style instead of representing food, water and habitat. This caused a riot amongst the students and they loved it. I thought this was an excellent little way to relate to student life and interests.
**OH DEER! Student Response Sheet**

**Collecting Data:**

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<tr>
<th>YEAR (_________ Axis)</th>
<th>DEER POPULATION (_________ Axis)</th>
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Making a Graph
Short Answers Questions:

1. What does the vertical axis represent?

__________________________________________________________________________________________

2. What does the horizontal axis represent?

__________________________________________________________________________________________

3. What is the mean (average) deer population? ____________________________

4. Does this line graph use data from a census or a sample? Why?

__________________________________________________________________________________________

__________________________________________________________________________________________

5. In what year is the deer population the greatest? What are some reasons that explain the large deer population?

__________________________________________________________________________________________

__________________________________________________________________________________________

6. In what year is the deer population the smallest? What are some reasons that explain the small deer population?

__________________________________________________________________________________________
7. In your graph, what do the changes in your line represent?

__________________________________________________________________________________________

8. Examine your graph. What factors may have caused the following population changes:

a. between years 1 and 2?

__________________________________________________________________________________________

b. between years 6 and 7?

__________________________________________________________________________________________

c. between years 9 and 10?