

# POST-SITE ACTIVITY

## GRAPHING TRENDS



**Grade Level:** High School

**Subject Area:** Science

**Activity time:** 60 minutes

**Setting:** Classroom

**Skills:** Graphing, Analyzing, Applying, Assessing, Calculating, Charting, Evaluating, Formulating questions, Hypothesizing, Inferring, Interpreting, Predicting, Summarizing

### Materials:

- “Graphing Salamander Trends” Worksheets found on pages 2-5
- Comparison Graph worksheet found on page 6
- “Graphing Salamander Trends” Worksheets Answer Sheet found on pages 7-9
- Pen/pencil

### Objectives:

- 1) demonstrate the ability to graph data
- 2) determine through inference and graphing the greatest predictor of salamander behavior between three variables

### Background:

When students visited the Smokies on their field trip they participated in the Salamander study. They may not have participated in the tree cookie study, but were made aware of the study during their time in the Smokies. This lesson will allow students to graph using the previously collected data from the Hands on the Land website. After graphing the data, the students will make inferences in determining the greatest predictor of salamander behavior between three variables.

### Procedure:

Have the students complete the “Graphing Salamanders Trends” worksheets (pages 2-5) individually, in pairs, or in small groups. A teacher answer key is provided on pages 7-9.



# GRAPHING SALAMANDER TRENDS

Determine the greatest predictor of number of salamanders found by creating three separate graphs for each of the three Wood Cookie Sets (total of 9 graphs): Diameter of average cookie (cm) to # of Salamanders found, Thickness of cookie (cm) to # of Salamanders found, and Distance from Stream (m) to # of Salamanders found. The Number of Salamanders found is placed on the Y-axis.

Wood Cookie Identification	Diameter of cookie (cm)	Thickness of cookie (cm)	Distance from Stream (m)	Number of Salamanders
A1	39.5	10.2	0	11
A2	40.8	9	10	5
A3	38.8	9.6	20	5
A4	41.7	9.4	30	8
A5	34.4	8	40	6
A6	32.2	10	50	4
A7	33.2	8.4	60	1
A8	34.7	9	70	1
A9	31.4	9.6	80	7
A10	38.4	7.8	90	2

Wood Cookie Identification	Diameter of cookie (cm)	Thickness of cookie (cm)	Distance from Stream (m)	Number of Salamanders
B1	32.1	9	0	10
B2	35.7	8	10	2
B3	35.1	9.6	20	3
B4	33.1	9.2	30	4
B5	32.4	8.2	40	6
B6	33.8	9	50	3
B7	31.4	9	60	3
B8	33.1	8.6	70	2
B9	30.8	9	80	3
B10	31.4	3.8	90	1

Wood Cookie Identification	Diameter of cookie (cm)	Thickness of cookie (cm)	Distance from Stream (m)	Number of Salamanders
C1	35.9	9.8	0	16
C2	32.6	8.8	10	10
C3	37.5	6.8	20	12
C4	33.2	7	30	7
C5	35.3	6.8	40	4
C6	34.8	8	50	3
C7	34.9	7	60	2
C8	31.5	6	70	3
C9	38.5	15.2	80	4
C10	32.1	3.8	90	0

### “A” Wood Cookie Identification Graphing Set

For 1-3, graph the following for Wood Cookie set “A.” Remember to label your axes.

1. Diameter of cookie (cm) to  
Number of Salamanders found

2. Thickness of cookie (cm) to  
Number of Salamanders found

3. Distance from Stream (m) to  
Number of Salamanders found



### “B” Wood Cookie Identification Graphing Set

For 4-6, graph the following for Wood Cookie set “B.” Remember to label your axes.

4. Diameter of cookie (cm) to  
Number of Salamanders found

5. Thickness of cookie (cm) to  
Number of Salamanders found

6. Distance from Stream (m) to  
Number of Salamanders found



### “C” Wood Cookie Identification Graphing Set

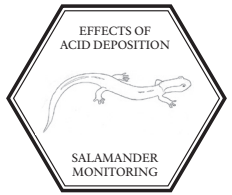
For 7-9, graph the following for Wood Cookie set “C.” Remember to label your axes.

7. Diameter of cookie (cm) to  
Number of Salamanders found

8. Thickness of cookie (cm) to  
Number of Salamanders found

9. Distance from Stream (m) to  
Number of Salamanders found





# Graphing Trends Questions

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10. What trends in salamander abundance are you seeing as diameter of cookie, thickness of cookie, and distance to stream change?
11. What is the best predictor variable to explain the number of salamanders found under each cookie?
12. What is the best way to know that the graphed results are dependable or just a one-time occurrence?
13. Combine all three replicate trials (A1+B1+C1, etc) of number of salamanders found and average the three to more clearly show the trend. Round to whole salamander (i.e. 5.9 = 6). Place information below.

Wood Cookie Number	Average number of salamanders found
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____
8	_____
9	_____
10	_____



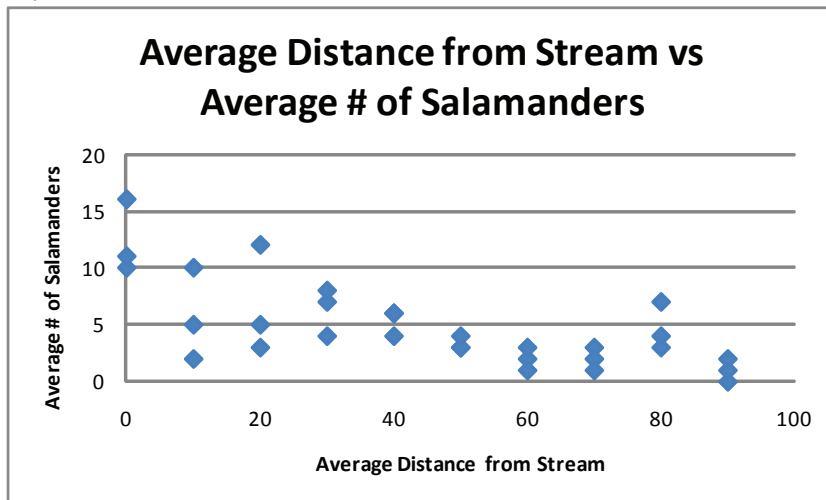
14. Graph the average number of salamanders found under each cookie number to distance in meters from the stream. Remember to label your axes.



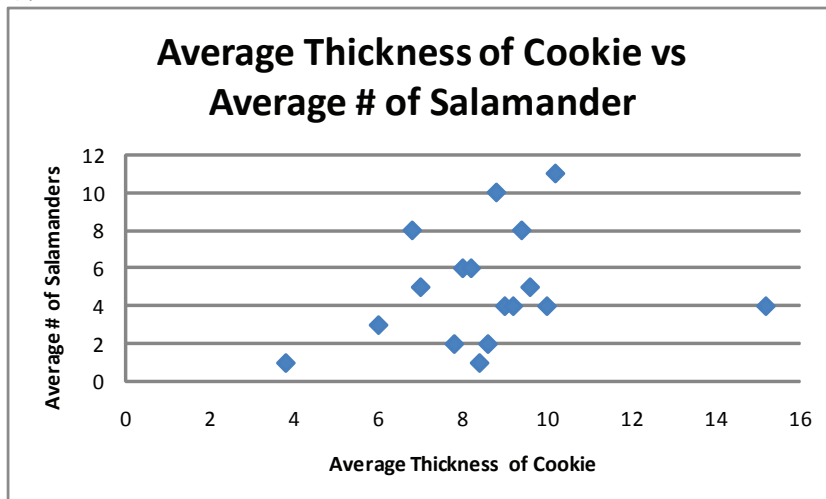
15. After graphing #14 wait for your teacher to give out a Comparison Graph worksheet. Check your completed graph from #14 to Graph A. Compare the three average graphing sets and decide what the best predictor variable is for explaining the number of salamanders found under each cookie.

# COMPARISON GRAPHS

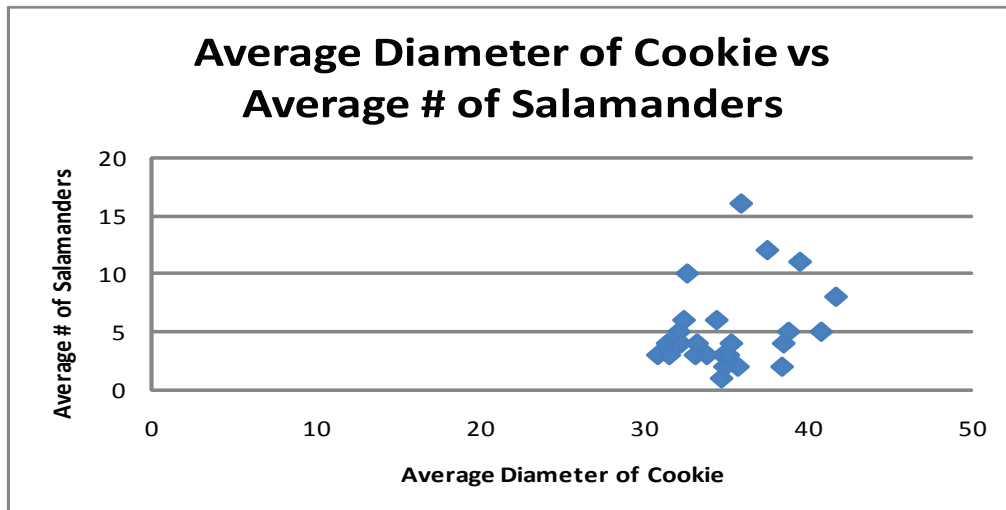
A.



B.



C.



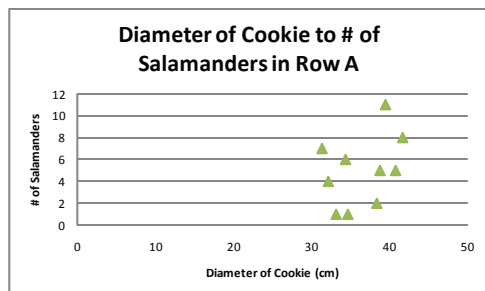
# GRAPHING SALAMANDER TRENDS

## TEACHER ANSWER KEY

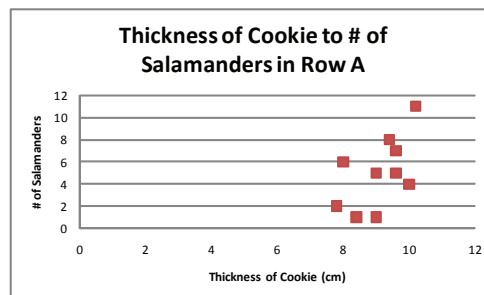


### “A” Wood Cookie Identification Graphing Set

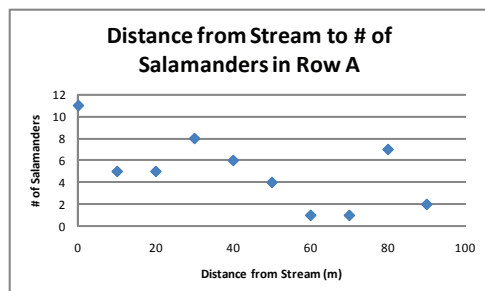
1. Diameter of cookie (cm) to  
Number of Salamanders found



2. Thickness of cookie (cm) to  
Number of Salamanders found

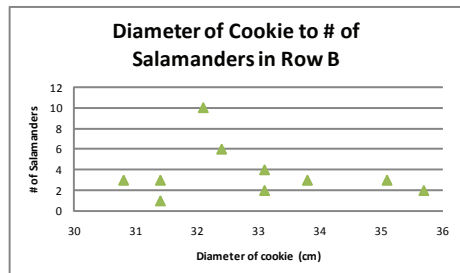


3. Distance from Stream (m) to  
Number of Salamanders found

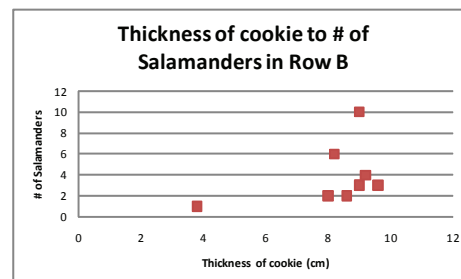


### “B” Wood Cookie Identification Graphing Set

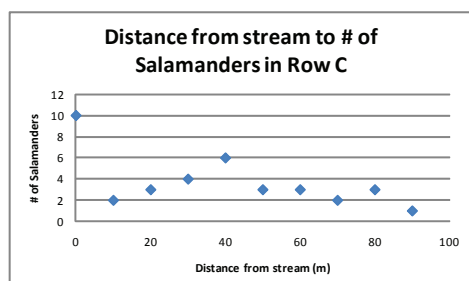
4. Diameter of cookie (cm) to  
Number of Salamanders found



5. Thickness of cookie (cm) to  
Number of Salamanders found

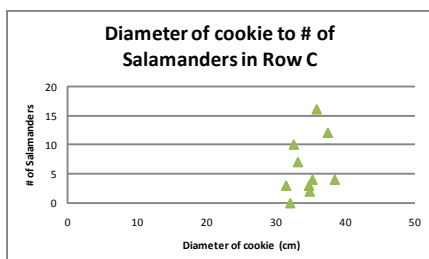


6. Distance from Stream (m) to  
Number of Salamanders found

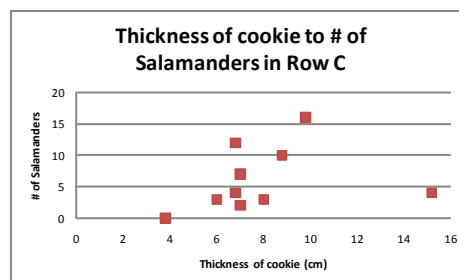


## “C” Wood Cookie Identification Graphing Set

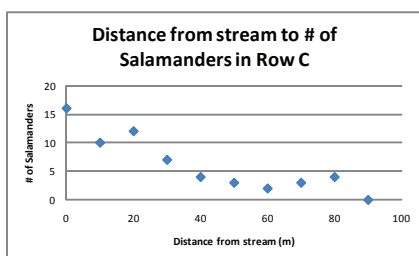
7. Diameter of cookie (cm) to  
Number of Salamanders found



8. Thickness of cookie (cm) to  
Number of Salamanders found



9. Distance from Stream (m) to  
Number of Salamanders found



### Graphing Trends Questions

10. What trends are you seeing?

*There seems to be no correlation between the diameter of cookie to number of salamanders found. There may be a weak trend towards more salamanders under thicker cookies, but this may not seem obvious to your students. The clearest trend is a correlation between distance from stream to number of salamanders found.*

11. What is the best predictor variable of the three graphs?

*The distance to stream to number of salamanders found shows the clearest trend of the three.*

12. What is the best way to know that the graphed results are dependable or just a one-time occurrence?

*Replication is important. Replication in science helps make science a self-correcting system. One might go back on different days to determine if the new data has the same trends or combine the data from the three sets of cookies.*

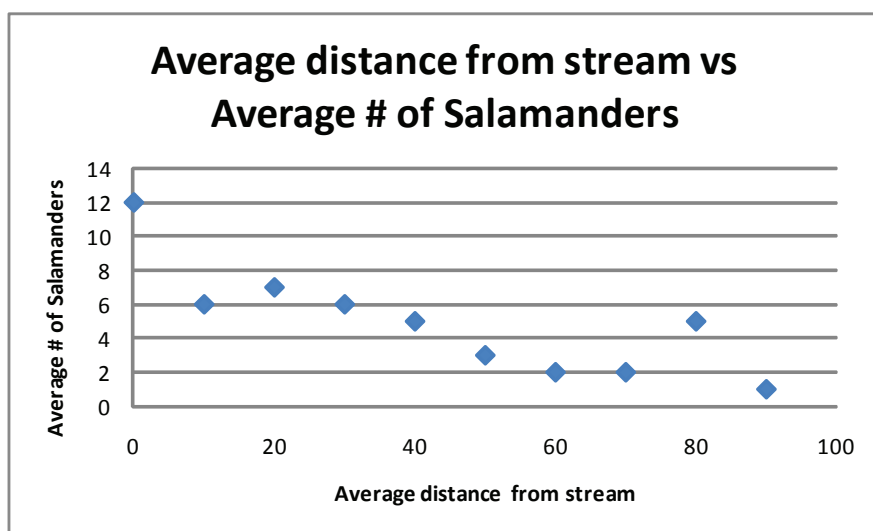


13. Combine all three replicate trials (wood cookie A plus B, etc.) of number of salamanders found and average the three to more clearly show the trend. Place information below.

Wood Cookie Number	Average number of salamanders found
1	12
2	6
3	7
4	6
5	5
6	3
7	2
8	2
9	5
10	1

14. Graph the average number of salamanders found to average distance from stream (m).

Distance from stream	Average number of salamanders found
0	12
10	6
20	7
30	6
40	5
50	3
60	2
70	2
80	5
90	1



15. What is the best predictor variable for explaining the number of salamanders found under each cookie.

*The best indicator for number of salamanders found is distance from the stream.*