

Pi Day Activity

*Arkansas 4-H STEM Curriculum
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OVERVIEW & PURPOSE

Derive and understand the concept of Pi by measuring the diameter and circumference of different circular objects.

OBJECTIVES

1. Participants will understand the ratio between circumference and diameter.
2. Participants will emphasize measuring techniques.
3. Participants will be able to derive π using their measurements.

MATERIALS NEEDED

1. Different sized circular objects. (Ex: jar lid, quarter, bucket, etc.) (for Pi Day fun, get different sizes of pies such as moon pie, oatmeal cream pie, etc)
2. Ribbon (can also use twine or string)
3. Scissors
4. Ruler
5. Calculator
6. Record sheet printout

ACTIVITY

1. What is the circumference of an object? **Hold up one of the circular objects.** (Answer: the distance around the outside of the circle, if we were to walk around the edge of the circle it would be how far we walked)
2. What is the diameter? (Answer: The distance across the middle of the circle through the center.)
3. Have the 4-H'ers use the ribbon and measure the length of the circumference around one of their objects. Cut the ribbon where the ribbon starts so the length of the ribbon is the length around the circle.
4. Get a NEW piece of ribbon to measure across the circle to find the diameter. (HINT: It will be the longest segment.)
5. Compare the two lengths of ribbon. Which one is longer? (Answer: The circumference is longer) Can you fold the longer one in half to fit the length of the shorter one? Fourths? Thirds? (HINT: Thirds should be your magic number to be

about the same length.)

6. Repeat the process with the remaining circular objects.
7. Are all the comparisons of ribbon the same with all sizes of circles? (*Answer: yes*)
8. Let's measure the ribbon of each of your objects and record them on your record sheet.
9. What is a ratio? (*Answer: A ratio is a comparison of 2 numbers, most of the time it is written as a fraction and can be written as a decimal number.*)
10. Write the ratio of Circumference to Diameter. This means that the circumference will be on top as the numerator and diameter will be on bottom as the denominator.
11. What do you observe of your fractions? (*Answer: they may observe that if you reduce the fraction they will all be about the same*)
12. Use a calculator to divide the fraction and get a decimal and record on your sheet.
13. You have just derived pi! (or approximately close to it)

Reflect & Review

1. What did you learn today that you didn't know before about circles?
2. Why do you think the ratio is the same every time?
3. Why do you think it is not exact?
4. Where might you use something from today?

ASSESSMENT

Use the bottom half of the activity sheet for assessment options. These can be as exit tickets, group assessments, etc. Be sure to document any observations as soon as you can from administering the lesson.

1. Can the student effectively tell the ratio for the circumference and diameter?
2. Can the student effectively derive the value of π ?
3. Can the student measure the length of the ribbon or twine?

VIDEO RESOURCES

- [Finding Pi Using Everyday Objects](https://youtu.be/WPuzpggl9Z4): <https://youtu.be/WPuzpggl9Z4>

RESOURCES

- [Pi Day Activities](https://www.exploratorium.edu/pi/activities): <https://www.exploratorium.edu/pi/activities>

EXTENSIONS

- What jobs use the circumference and understanding of pi as part of their jobs?
- [How do scientists measure trees?](#) - National Wildlife Federation