Unit F: Angles, triangles, circumference and area of circles

| Day | Objective | Activity | Assessment |
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| Day One | Draw and label angles | Introduce vocab for angles section of unit. Look for angles around the classroom. Label/name angles worksheet. Draw a picture. | Draw a picture of anything you want and accent the angles in the picture. Include at least ten angles. |
| Day Two | Describe attributes of angles/ triangles | Vocab – obtuse, right, acute<br>Use protractor to measure angles, create mnemonic device to remember types of angles | Label the angles on the drawing from day one.<br><br>Share mnemonics with the class. |
| Day Three - Four | Measure round objects and relate measurements to the number pi | Pizza activity – label triangle toppings, cut out pizza and toppings, glue toppings on pizza<br><br>Measure and record other objects around the room | Students turn in pizza and I visually check diameter, radius, and types of topping triangles as well as worksheets used to record measurement and averages |
| Day Five | Use formula for circumference of a circle | Find or invent situations where measuring the circumference of something round is impossible. How could you find it? | Write a two paragraph story about the adventure you have while finding the circumference of a very large object. |
| Day Six | Use formula for area of a circle | What are situations where the area of a circle would be needed? | Add circles to your drawing from the first day. Somehow incorporate the circumference and area formulas and measurements into your drawing. |
| Day Seven | | | Summative assessment |

Lesson Three (Day three)  Pizza Pi

**Supplies**

1. Copy circles for crust, different types of triangles to be used as toppings for pizza
2. Copy of list of items I want them to note when measuring their pizza (worksheet)
3. String for measuring
4. Ruler
5. Protractor
6. Scissors
7. Glue stick

**Objectives**

The students will be able to accurately measure round objects, diameter and radius of circles.

**Classroom procedures**

- As each student comes into class they pick up their folder from the appropriate crate.  In their folder will be a sheet of paper with outlines for pizza crust (circle) and toppings (triangles) for them to cut out as well as instructions to retrieve scissors, string, glue stick ruler and protractor from next to the folder crate and begin cutting out shapes.  There will also be a worksheet with information they need to discover about their own pizza pi.
- The warm-up for this day is cutting out their crust and toppings.
- When the tardy bell rings I will take two minutes or less for announcements and straight to “musical desks.”
- “Musical desks” - We will have a 30-second desk moving transition that was introduced

and practiced at the beginning of the year. The classroom is already set up with groups of two desks. Students move desks to groups of 4. Familiar music plays for 30 seconds while they are moving and getting settled. I let them know when they have 10 seconds left.

**Introduction (Day 3)**

- Starting with "Raise your hand if you like pizza pie." "What toppings are your favorites?" "Stand up if you have ever made homemade pizza pie." "Raise your foot if your favorite pizza pie comes from Little Caesars." "Raise your hand if your favorite is Papa Johns." Mention a few others using the words "pizza pie" to tie it into the lesson which contains pi, as in the area of a circle is $\pi r^2$ and the circumference of a circle is $2\pi r$.

**Presentation**

- Point out to students that the shape of the toppings included in their cut-outs are triangles. Have them label the triangles with the type of triangle – obtuse, right, acute, and scalene, isosceles, equilateral.
- Before students continue cutting and pasting we review radius, diameter and circumference definitions. I introduce the measuring procedure I would like them to use. They have 5 additional minutes to complete their pizza and begin measuring. The students will put their string around the outside edge of their pizza and mark one revolution, then measure the length of the string representing the circumference of the pizza and record the measurement. They will be measuring in inches and also in centimeters.

- Students will find other round objects that I have placed around the classroom for them to measure. They need to measure three objects and record the measurements on the worksheet.
- I will be circulating, helping and asking/answering questions as needed.
- The four students in each desk grouping will work together, understanding that their pizza pies might not have the same measurements, then take averages of the measurements of circumference, diameter and radius. (They learned how to compute averages in $6^{th}$ grade).
- When everyone is finished with their pizza and has their measurements completed, we will go around the room and each group of 4 will tell us the average of the circumference, diameter and radius from their group.
- Review circumference, diameter and radius.
- Clean up and put paper pizza/toppings into their folders for use the next day.
- Replace folders in crate.

Lesson 4 (Day 4) Pizza Pi Continued

**Supplies**

1. Copy of list of items I want them to note when measuring
2. String for measuring
3. Ruler
4. Protractor

**Objective**

Students will relate the measurements of radius, diameter and circumference to the number pi. Students will find the area of circles using the formula $\pi r^2$.

**Classroom Procedures**

Students will follow procedures for retrieving folders and getting settled. Desks are already in groups of 4. Warm up will be two items: Draw a right triangle and label it ABC. Draw and isosceles triangle and label it STU.

**Introduction**

- Ask what is their personal record for number of pieces of pizza they have eaten in one sitting. We can find out the area of the pizza they have eaten.

**Presentation**

- Review the previous day's work.
- Finding $\pi$: circumference divided by diameter is a number called pi. No matter the size of the circle if you divide the circumference by the diameter you will always get pi. Have them practice finding pi by using the circumference and diameter measurements of the paper pizzas in their groups, and the other objects measured the day before.
- Circumference can also be found by using the formula $2\pi r$.
- We will go around the room and each group of 4 will remind us of the average of the circumference, diameter and radius from their group and tell us what they found about the number pi.
- We will talk about what area means, remind them of formulas for area of other shapes they already know like squares, triangles and rectangles, etc.
- Area of a circle is $\pi r^2$ or $\pi$*r*r. How does that relate to area of other shapes you

already know?

- Using the radius measurements from each pizza in your group, find the area.
- Have each group approximate the diameter of a real pizza eaten by the person in their group who has eaten the most pieces of pizza in one sitting. Calculate the area of the amount of pizza that person ate. They may need to find the area of a whole pizza and then estimate a fraction of that amount.
- Each group will report the area of the pizza eaten.

In an ideal world real pizza would be delivered right about then and a pizza party would commence.

- Students would place their paper pizzas and worksheets in their folders and return them to the crates.

Name _____ Period _____

Pizza Pi Worksheet (Lesson 3)

1. Measure your paper pizza and record the following:

Diameter in_____ cm _____

Radius in_____ cm _____

Circumference in_____ cm _____

2. What is the average in your group?

Diameter in_____ cm _____

Radius in_____ cm _____

Circumference in_____ cm _____

3. Measure three other round objects in the classroom and record the following:
*Object 1* _____

Diameter in_____ cm _____

Radius in_____ cm _____

Circumference in_____ cm _____

*Object 2* _____

Diameter in_____ cm _____

Radius in_____ cm _____

Circumference in_____ cm _____

*Object 3* _____

Diameter in_____ cm _____

Radius in_____ cm _____

Circumference in_____ cm _____

Name _____ Period _____

Pizza Pi Worksheet (Lesson 4)

$\frac{\text{circumference}}{\text{diameter}} = \pi$

1. My pizza: circumference _____ divided by diameter _____ = _____

2. Other pizza: circumference _____ divided by diameter _____ = _____

3. Other pizza: circumference _____ divided by diameter _____ = _____

4. Other pizza: circumference _____ divided by diameter _____ = _____

Area of a square: _____

Area of a triangle: _____

Area of a rectangle: _____

Area of a circle: _____

5. Area of my pizza _____

Area of other pizza _____

Area of other pizza _____

Area of other pizza _____

6. Approximate diameter of pizza eaten by the person who ate the most pizza in one sitting:

_____

Area of that pizza _____

How many slices of pizza did they eat? _____

What is the area of the pizza they ate? You may need to find the area of a whole pizza and then estimate a fraction of that amount.

Cut out shapes.  Identify types of triangles, write directly on the triangles what type of triangle it is.