**Lesson Plan**

**Subject/Grade level: 7th grade Math**

**Standards:**

TEKS 111.27.9B: The student is expected to determine the area and circumference of circles

CCRS X.B.1: Use multiple representations to demonstrate links between mathematical and real world situations

ELPS 2.D: Monitor understanding of spoken language during classroom instruction and interactions and seek clarification as needed

ELPS 3.E: Share information in cooperative learning interactions

**Objective:**

Students will create and present an in-class project over either the area or circumference of a circle, scoring at least an 80% on the rubric.

**Focus:**

“Survey activity”: Students will be asked questions and will have to either stand up or sit down depending on their answer. This allows the teacher to see how much prior knowledge his/her students have about the lesson.

“Review”PowerPoint: Students will fill in their “Circle Review” as the teacher is reviewing.

The teacher will have the same worksheet as his/her students on the overhead camera and will read aloud the words “circle, radius, diameter and irrational” along with their definitions one at a time. After each word, students will repeat after them in unison along with the definition of the term and then will fill in the blank associated with that term. The teacher will then repeat the word one more time and place the term where it belongs so students can check their understanding.

**Instructional Delivery:**

“Guided notes”: Students will be actively filling in their notes handout as they follow along to the PowerPoint. The educator will show students how to solve for the circumference of a circle as well as its area, using their specific formulas. The teacher will incorporate how to find both of these using the diameter and radius of a circle and what to do if only one is available.

 The teacher will link the concepts and learning to students’ personal lives using key vocabulary.

Real life application examples:

1. Your dad is wanting to purchase some carpet for the large, **circle** shaped study room in your house. How is he going to know how much carpet to buy?

Answer: By calculating the **area** of the room, this will allow him to know exactly how much carpet he will have to purchase.

2. Your mom is wanting to purchase fencing for her magnolia trees out in the yard to guard it from animals. How will she know how much is needed to **surround** it?

Answer: Calculating the **circumference** of the area she is wanting to fence off will tell her the exact amount of fencing she will need to purchase.

Differentiation strategy 1: Allow students to sit anywhere in the room while note-taking

Differentiation strategy 2: Incorporate cut-outs of various circles (pizza, donut, coin, pie, etc.) that are scaled to size so students are able to visual and touch while learning

**Check for understanding:**

* Can you find the circumference of a circle knowing only the radius?
* How can finding the area or circumference of a circle be applied in real life?
* How can you describe the difference between the circumference and the area?
* Can you find the area of a circle without squaring the radius?
* Can you find the area of a circle knowing only the diameter?
* Should you round pi to calculate the area and circumference?
* Why are we able to interchange formulas to find the circumference?

**Guided Practice:**

PowerPoint led guided practice. The teacher will take students through problems and what key components are needed solve for the area and circumference of a circle. Students will be given time to complete each problem on their own. Once students have completed the problem, they are instructed to look up at the teacher with their pencils down. The teacher will then ask a student who is confident in their answer to come up to the board and solve out the problem. This is where the teacher will give full class feedback to the students on why it is correct or not. The teacher will go through 5 problems this way.

**Check for understanding:**

* The teacher will call on students to display their understanding on the white board
* The teacher will correct the problem if need be using whole class feedback
* The teacher will ask students why the answer is correct
* The teacher will ask students why the answer is wrong if it is solved incorrectly
* The teacher will call on different students each problem
* The teacher will asks for questions to clarify any confusion

**Independent Practice:**

The teacher will continue to follow the scaffolding techniques by letting the students work with their peers as he/she walks around and observes. This is the students’ time to show off what they have learned.

Students will be given a large sheet of paper with markers where they will have to work together to create their own problem. Students must solve for either the circumference or area of a circle which will be assigned to by the teacher. The students must incorporate a circular object (coin, pizza, pie, donut, etc.) with either its radius or diameter included in the problem. The students must then solve their own problem, check their answer with the teacher, and then hang up their paper on the wall.

Once all groups have finished creating and solving their problem, one group at a time will present their problem to the class and allow their classmates to answer it. After a few moments, the students will go step by step on how to solve the problem correctly and the teacher will interrupt when needed.

Each student will be graded on presentation (How does the group present their problem to the class?), creativity (Is it neat? Is there a picture?), participation (Did the student participate in creating the poster? Does the student participate in other classmates’ problems?), a well-created question (Does the question have all components needed to solve the problem?), and instructional delivery (How did the group take their classmates through the problem? Was it explained well?). Each component is worth 20 points.

Differentiation strategy 3: Group 2 advanced students with 2 struggling students to create and solve their project

**Check for understanding**

* The teacher will walk around to each group to make sure they are following directions and have well-formulated problems
* The teacher will walk around the room to make sure the conversation is on topic and students are understanding the content
* The teacher will question students on components needed to solve the problem

**Closure:**

Pair/Share: Students will reflect on their learning and share with their shoulder partner 2 ways they can apply this new knowledge outside of class. One student from each pair will share one way with the class.

**Modifications/Accommodations/Enrichment/Reteach:**

**Modifications (Dyslexia, ADHD, Arthritis)**

1) Break instruction into parts (this may take longer) but it benefits students

2) Assign a buddy/peer for every lesson

3) Give the student a talking calculator to make reading numbers easier

4) Use a timer during the independent practice to keep students on task/make sure everyone is participating

5) Highlight key words for the student to focus on

6) Have the students recite in unison the instructional delivery to keep them focused

7) Allow the student to complete an alternate assignment that has less writing

8) Completely fill in the notes for the student to eliminate extra writing

**Accommodations (Dyslexia, ADHA, Arthritis)**

1) Read aloud the notes/have them sit next to a classmate who can help fill in the blanks

2) Give extra time to finish the project

3) Allow students to sit anywhere while taking notes

4) Assign the student as the leader of the group

5) Give the student a break from writing and allow them to just listen

6) Allow the student to record the lecture instead of writing

**Enrichment:**

1) Project: Locate a circular object of your choosing in the classroom and measure either the radius or diameter and solve for both the circumference and area (rulers will be provided). If you do not have a calculator, you may leave your answers in terms of pi. Be prepared to share your findings with the class.

2) Students who finish quickly may choose to either go on a computer to a math website (recommended by the teacher) or get a whiteboard and 5 problems from the teacher to solve.

**Reteach**: Each student will be provided with a “guided notes” handout. The teacher will then provide life size cut-outs of circular objects containing either a diameter or radius and place them on random student desks. The teacher will ask students who have an object to bring it up one at a time and the teacher will use that example to teach students how to solve for the area and circumference of that object/a circle. Students will be actively taking notes for each example while staying engaged.

**Circle Review**

**Directions: Follow along with me and fill in the blanks**

Center

π is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number

**Word bank:**

Circle

Radius

Diameter

Irrational