**Lesson Plan**

**Mathematics Course: \_X\_\_ 8th Math \_\_\_ Math 1 (9th) \_\_\_ Math 2 (10th)**

**Title of Lesson** \_\_\_\_Estimating Square Roots of Positive Numbers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit** \_\_\_\_Unit 2 – Powers That Be\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Purpose within unit (include information to help place this lesson within the unit)**:

 \_\_\_\_ Exploration \_\_X\_\_ Direct Instruction \_\_\_\_ Culminating Task

**Georgia Performance Standard** : M8N1.f. Estimate square roots of positive numbers

**Objective for This Class Period**: Students will be able to estimate square roots of positive numbers as whole numbers or decimals.

**Essential Question(s)** Why is it useful for me to know the square root of a number?

Why are some square roots estimated?

What are the steps for estimating square roots?

**Resources:** \* Mixed Review/Bell ringer

 \* Lesson Activator

 \* Worksheet Practice

 \* Pre-Make Number line or draw on board/Cards with square roots

 \* Ticket out the Door – Assessment

**Timing Outline :** \* Mixed Review/Bell Ringer – (5 minutes)

 \* Lesson Activator – (10 minutes)

 \* Lesson/ Number line activity and

 Questioning – (15 minutes)

 \* Practice – (15 minutes)

 \* Ticket Out the Door – (5 minutes)

**5-Question Mixed Review (Bell Ringer)- Project on board or copy on back of Ticket Out Door**

1. Square root of 64 is **8 or -8**

2. $\sqrt{64}$ is **8**

3. x2 = 64 so x is **8 or -8**

4. Principle square root of 64 is **8**

5. Area of a square is 64 so its side length is **8**

**Lesson Guide**

* Mixed Review/Bell Ringer – As students enter, they will complete the mixed review
* Review Mixed Review
* Activator: Have students write first 25 perfect squares (time, students should already

Know.)

* Teach how to estimate square roots using Steps by Dale Graham and Linda Meyer
* Review Practice Worksheet
* Activity Review - Give each student a card to tape or if magnetized to place on a number line already created at front of class. Have students to also estimate the decimal representation of their term under the card. (Give calculators to check decimal representation)
* Ticket Out the Door

A. $\sqrt{8}$ = **2**$\sqrt{2}$

B. $\sqrt{8}$ is between what 2 whole numbers? **2 and 3**

C. $\sqrt{8}$ is closest to which whole number? **3**

D. The decimal estimate of $\sqrt{8}$ to the nearest 10th is $≈$ **2.8**

E. 2$\sqrt{5} $is about $≈$ **4.5**

**Estimating Square Roots**

**M8N1. f**

**Show What You Know. (Check with calculator)**

 **Nearest Nearest**

 **Whole Number Decimal (tenth)**

**1.** $\sqrt{12}$ **≈ \_\_\_\_\_\_**3**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**3.5**\_\_\_\_\_\_\_\_**

**2. 3**$\sqrt{2}$ **≈ \_\_\_\_\_\_**4**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**4.2**\_\_\_\_\_\_\_\_**

**3.** $\sqrt{33}$ **≈ \_\_\_\_\_\_**6**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**5.7**\_\_\_\_\_\_\_\_**

**4.** $\sqrt{67}$ **≈ \_\_\_\_\_\_**8**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**8.2**\_\_\_\_\_\_\_\_**

**5. 5**$\sqrt{3}$ **≈ \_\_\_\_\_\_**9**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**8.7**\_\_\_\_\_\_\_\_**

**6.** $\sqrt{150}$ **≈ \_\_\_\_\_\_**12**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**12.2**\_\_\_\_\_\_\_**

**7.** $\sqrt{222}$ **≈ \_\_\_\_\_\_**15**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**14.9**\_\_\_\_\_\_\_**

**8.** $\sqrt{400}$ **≈ \_\_\_\_\_\_**20**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**20**\_\_\_\_\_\_\_\_**

**9.** $\sqrt{288}$ **≈ \_\_\_\_\_\_**17**\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**17**\_\_\_\_\_\_\_\_**

**10.** $\sqrt{28}$ **≈ \_\_\_\_\_\_**5**\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_**5.3**\_\_\_\_\_\_\_\_**

**Estimating Square Roots**

**M8N1. f**

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**4.** $\sqrt{67}$ **≈ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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Dale Graham and Linda Meyer

Thomasville City Schools