**Lesson Plan**

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

**Title of Lesson**  Multiplying and Dividing Square Roots

**Unit**  2

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

 \_\_\_\_ Exploration \_\_x\_\_ Direct Instruction \_\_\_\_ Culminating Task

**Georgia Performance Standard** (specific; include number and wording)

GPS:M8N1. Students will understand different representations of numbers including square roots, exponents and scientific notation.

g. Simplify, add, subtract, multiply and divide expressions containing square roots.

**Objective for This Class Period**: (What students will know/be able to do when they leave class that they did not know/were not able to do when they arrived – this day/ this class period)

Students will be able to multiply and divide expressions containing square roots.

**Essential Question(s)**

**How do I multiply and divide square roots?**

**Resources** (including attached activity sheets or link to resource, additional materials needed, etc.)

Bell Ringer- 4 question mixed review

Activating Strategy

Multiplying and dividing square roots graphic organizer

Practice Problems

Ticket Out the Door

**Timing outline**

Bell ringer- 3 question mixed review- **5 minutes**

Discuss the mixed review and activating strategy- **10 minutes**

Begin the lesson using the graphic organizer. Use a transparency of the graphic organizer on an overhead or SmartBoard for your discussion and guided practice. Ask propping questions during the guided practice to insure student comprehension- **15 minutes**

Students should complete practice problems using both multiplication and division of square roots- **20 minutes**

Assess the lesson using the Ticket Out the Door- 5 minutes

**5-Question Mixed Review**

\*\* See page with this title

**Lesson Guide (**a bulleted or numbered outline of the lesson that must include the items listed below).

* Activating Strategy \*\* See page with this title
* Multiple representations, including hands-on activities \*\* See pages with these titles
* Technology (including photos, video clips, Smart files, PowerPoint, calculator use, etc.)

Use transparency of Graphic Organizer on overhead projector or use SmartBoard

* Questions throughout – more open than closed \*\* Contained in the lesson
* Evidence of learning (assessment) – how you’ll know they got it; formative and summative

Assessment- Ticket Out the Door \*\* See page with this title

**Four Question Mixed Review**

|  |  |
| --- | --- |
| **Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

**Use the following square root problem to label the coefficient (1), the radical (2) and the radicand (3).**

**Place the numbers in the correct circle.**

|  |
| --- |
| 4$√$28 |

|  |
| --- |
| **Is the problem in simplest form? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Why or why not? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

**Activating Strategy**

**Write the first 10 perfect squares.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  **1. \_\_\_\_\_\_\_\_** |  **2. \_\_\_\_\_\_\_\_** |  **3. \_\_\_\_\_\_\_\_** |  **4. \_\_\_\_\_\_\_\_** |  **5. \_\_\_\_\_\_\_\_** |
|  **6. \_\_\_\_\_\_\_\_** | **7. \_\_\_\_\_\_\_\_** |  **8. \_\_\_\_\_\_\_\_** | **9. \_\_\_\_\_\_\_\_** | **10. \_\_\_\_\_\_\_\_** |

|  |  |
| --- | --- |
| brick wall photo.jpg | **This section of the brick wall outside Lowndes High School has an area of 49 square feet. Write the perfect square for this situation.****\_\_\_\_\_\_ X \_\_\_\_\_\_ = \_\_\_\_\_\_** |





**How do you multiply square roots?**

|  |
| --- |
| **Multiply the coefficients 2**$√$**3** $∙$ **3**$√$**2 (2** $∙$ **3 = 6)****Write your results for the multiplication of the coefficients in front of the radical.****6**$√$ |
| **Multiply the radicands 2**$√$**3** $∙$ **3**$√$**2 (3** $∙$ **2 = 6)****Write your results for the multiplication of the radicands under the radical.**$√$**6****The final result is 6**$√$**6** |

**Try these.**

**1. 3**$√$**7** $∙$ **2**$√$**5**

**2. 5**$√$**3** $∙$ **3**$√$**7**

**3. 4**$√$**5** $∙$ **2**$√$**6**

**How do you divide square roots?**

|  |
| --- |
| **Divide the coefficients 21**$√$**15** $÷$ **3**$√$**5 (21** $÷$ **3 = 7)****Write your results for the division of the coefficients in front of the radical.****7**$√$ |
| **Multiply the radicands 21**$√$**15** $÷$ **3**$√$**5 (15** $÷$ **5 = 3)****Write your results for the division of the radicands under the radical.**$√$**3****The final result is 7**$√$**3** |
|  |

**Try these.**

**1. 14**$√$**6** $÷$ **2**$√$**3**

**2. 10**$√$**20** $÷$ **5**$√$**2**

**3. 24**$√$**6** $÷$ **8**$√$**3**

**Ticket Out the Door**

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Show your work.**

**1.** $√$**3** $∙$$√$**3 = \_\_\_\_\_\_**

**2. 2**$√$**6** $∙$ **3**$√$**5 = \_\_\_\_\_\_**

**3.** $√$**7 = \_\_\_\_\_\_**

$√$**16**

**4. The number underneath the radical is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**5. The number in front of the radical is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**