

A Power Play

Objective:

By the end of the lesson/activity, the students will be able to:

- Understand and apply the product and power to power rule to simplify numerical expression.

Materials:

- “Basketball Bases” activity sheet
- “Power Play” handout
- Glue sticks
- Scissors

Teacher Preparation:

- Copy the “Basketball Bases” activity sheet. You may want to pre-cut to alleviate losing instructional time.
- Copy the “Power Play” handout for each student.
- You may choose to group students or have them work individually with imbedded pair-share moments.

Whole Group Mini-Lesson:

- Have the students analyze the numerical expression in an example of one of the “Power Play” handouts.
- Read the problem aloud and allow the students to read it aloud as well.

Question(s):

- “How would you read this expression?”
- “How do you differentiate an exponent from a base?”
- “What do exponents tell you to do?”

Whole Group Mini-Lesson (continued):

- “Using your cutouts, place the number of basketballs you think represents the expression 53 on your desk.”

South Carolina College- and Career-Ready Standards for Mathematics:

8.EE.1 Understand and apply the laws of exponents (i.e., product rule, quotient rule, power to a power, product to a power, quotient to a power, zero power property, negative exponents) to simplify numerical expressions that include integer exponents.

- “Discuss with a classmate [or members in your group] why you chose that number of basketballs. If you agree on the answer, do you have the same reasoning for your answer?”
- “What operation should go between each base when you glue them to your handout?”
- Check for student understanding and the use of key vocabulary. *Do not forget to have the students write the multiplication symbol between each basketball because the role of the exponent is to show how many times to multiply the base to itself.*

Activity:

- At this point, allow the students to work in their groups or individually to complete the self-guided activity. Your role as facilitator is to assist students who need more support and check for student mastery.
- Depending on the level of your students mastery, you may want to allow them to go ahead and glue their basketballs onto their handout or wait for you to check before the gluing process takes place.

Extensions:

- You can apply the “Power Play” power rule handout to continue the concepts of exponents.
- Have the students analyze a short cut in finding the products of bases that are the same.

Name: _____ Date: _____ Period: _____

Power Play

Example 1: Display an understanding of exponents by showing 5^3 in expanded form using the basketballs.

Glue your basketball bases here.

What is the value of the 5^3 in standard form?

Show your calculations here.

Answer: _____

Example 2: Display an understanding of multiplying bases by showing $5^3 \times 5^2$ in expanded form using the basketballs.

Glue your basketball bases here.

What is the value of the $5^3 \times 5^2$ in standard form?

Show your calculations here.

Answer: _____

Name: _____ Date: _____ Period: _____

Power Play

Example 3: Display an understanding of raising a power to a power $(5^3)^2$ in expanded form using the basketballs.

Glue your basketball bases here.

What is the value of the $(5^3)^2$ in standard form?

Show your calculations here.

Answer: _____

