Mathematical Context

Mathematical Goals for the Lesson (from T-1 of Lesson Plan):

The *Applying Properties of Exponents* lesson is designed to assess how well students are able to:

- Recall and use the properties of exponents to generate equivalent numeric expressions.
- Identify the appropriate property to use and apply it correctly.
- Check the numerical value of an expression involving exponents without using a calculator.

Discussion Questions to Develop the Big Mathematical Picture[1]

1. What big mathematical relationships, patterns, or principles do we want students to understand in this lesson?
2. What is one or more key mathematical understanding(s) that this lesson builds upon? What is one or more key mathematical understanding(s) that this lesson builds towards? What connects those understandings?
3. How might different representations or solution strategies within the lesson connect to each other in order to deepen our students' mathematical understandings?

Directions for the Mathematical Activity:

Work in groups of two or three. You will receive cut-up copies of *Card Set: Expressions* and *Card Set: Single Exponents* (these are indicated with an S or an E in the top left corner).

When working together, take turns to:

1. Select an expression card and find all other cards that have the same value as the one you have chosen.
2. Explain your matching to your partner(s).
3. They will then check your matching and challenge your explanation if they disagree.
4. Continue to take turns until you have all of the cards within ten groups.

For the version of these instructions for students, see T-5

Discussion Questions Focusing on the Mathematical Activity

1. What are some different mathematical approaches for completing the task?
2. What is a big mathematical idea present in this lesson?
3. How do the tasks in the lesson provide opportunities to make student thinking visible and provide opportunities to build their thinking about important mathematical ideas?

[1] From: TRU Math Conversation Guide

Mathematical Context Materials

Directions: Cut out the Card Sets on the next two pages to form the cards for the grouping activity. Give one set to each group of two or three.

Card Set: Expressions

E1 $2^2 \times 3^2$	E2 $3^2 - 2^3$
E3 $2^2 + 2^3$	E4 $2^2 \div 2^3$
E5 $6^8 \div 6^4$	E6 $2^2 - 2^2$
E7 $3^2 + 3^3$	E8 $4^2 \div 2^3$
E9 $2^3 \div 2^{-2}$	E10 $(2^3)^2$
E11 3×2^2	E12 $2^3 \times 2^3$
E13 $5^2 - 3^3$	E14 $(3^2 \times 2^2)^2$

Card Set: Single Exponents

S1 2^1	S2 2^5
S3 $(-2)^1$	S4 2^{-1}
S5 2^0	S6 2^6
S7 6^4	S8 6^2
S9 0^2	S10 4^3