Math Task 1: Number Tricks
Start with some number. Now multiply the number by 21. Add 12 to what you have now. Divide by 3. Subtract 4. Divide by 7. Now you should be magically back to where you started.

1. Write an expression using the four operations symbols (+,-,x, ÷) that presents the steps above. Use as few parentheses as possible, while making sure your expression fits the steps and follows the order of operations.
2. Why does this work?
3. Create your own number trick like the one above with at least 5 steps. Write the expression for your number trick.

Math Task 2: Identity Elements models/problems
Zero (the additive identity) and one (the multiplicative identity) often cause conceptual challenges for children. Sometimes the 'rules' involving zero and one can seem arbitrary to students. Helping students understand the concepts using word problems and models is preferable to arbitrary rules. The following are word problems and/or models involving zero and one. Give an equation and explain your work on each one.

Multiplying by zero:
1. How many grams of fat are there in 7 servings of celery, if one serving of celery has zero grams of fat?
2. Model with a number line 0x5. Now model 5x0.
3. Model with an array 0x5 and 5x0.

Multiplying by one:
4. Model with an array 1x6 and 6x1.

Dividing with zero:
5. Take thirty counters. How many sets of zero can be made?
6. Put twelve counters in zero equal groups. How many are in each group?
7. Take zero blocks and put them into 10 equal groups. How many are in each group?
8. Take zero counters. How many sets of 4 can be made?

Dividing by one:
9. Take twenty-five counters. How many sets of one can be made?
10. Put 13 counters in one equal group. How many are in each group?

Math Task 3: Scientific Notation
Scientific notation is a convenient way to represent very large or very small numbers. Many students think that scientific notation involves separate rules that are different from our 'regular' number system. However, scientific notation is simply writing the number using place value.

1) Consider the number 3.6×10^{14}. Write this number in positional notation. What place value does the 3 represent? What place value does the 6 represent? How can you tell?

2) Compute $(4 \times 10^7) \times (8 \times 10^6)$ showing all of your work. Give your answer in both scientific notation and the expanded form (see module 1). How are scientific notation and expanded form the same? How are they different?

3) Compute $(4 \times 10^7) + (8 \times 10^6)$ showing all of your work. Give your answer in scientific notation and expanded form. What is the advantage and disadvantage to adding numbers in scientific notation?

3) How would scientific notation look if we worked in base six? Write 320000000000000_{six} in base-six scientific notation.