TWOS ARE TOO MUCH

Objective: Explore divisibility rules.

Materials: Two's are Too Much Handouts
Markers
Calculators

Procedures:

1. Participants should work in pairs.
2. Hand out Two's are Too Much Activity sheets.
3. Let participants work through the activity.
4. After the allotted time, have participants discuss the patterns they found in each of the activities.

Extensions:

1. Investigate the rules for divisibility for seven and eleven.
2. Have participants design activities for seven and eleven

Notes:

1. This activity is closely related to the divisibility activity in session 1.

The Two's are Too Much

1. Working with a partner, list the first 10 multiples of 2.
2. The following numbers are also multiples of 2:

96	732	666	128	550
2,022	200	1,344	988	5,602
9,006	484			

3. What pattern (s) do you observe in the multiples of 2?
4. State a rule you can use to determine if numbers are divisible by 2.
5. Using your rule, check the numbers from the following list that are divisible by 2. Verify your results on the calculator.

218	6,774	5,901	793	590

6. Write a 4-digit number that is divisible by 2. Take the units digit off your number. Do the remaining 3 digits make a number divisible by 2? Why or why not?

Those Thrilling Threes

1. Working with a partner, list the first 10 multiples of 3.
2. The following numbers are also multiples of 3:

111	309	1,002	543	93
18,117	750	9,324	2,025	36,108
2165,742				

3. Add up the digits in the multiples of 3 listed in step 2. For example, 111 is 1+1+1=3.
4. What pattern (s) do you observe in the multiples of 3?
5. State a rule you can use to determine if numbers are divisible by 3.
6. Using your rule, check the following numbers for those that are divisible by 3. Verify your results on the calculator.

740	1,016	321	7,050	5,301

7. Write a 2-digit, 3-digit, and 4-digit number that is divisible by 3. The number, 12,097 is not divisible by 3. Can you change one digit and make it into a number that is divisible by 3?

Fab Four

1. Working with a partner, list the first 10 multiples of 4.
2. The following numbers are also multiples of 4:

324	736	548	916	4,412
5,116	3,148	29,480	9,172	7,260
100,004	33,928			

3. What pattern (s) do you observe in the multiples of 4? (Hint: Look at the last two digits in each number).
4. State a rule you can use to determine if numbers are divisible by 4.
4. Using your rule, check the numbers from the following list that are divisible by 4. Verify your results on the calculator.

730	922	4,441	9,920	8,484

6. Even numbers are always divisible by 2. Are all even numbers always divisible by 4? Can you think of an even number that is not divisible by 4?
7. Think of a number that is divisible by 2, 4 and 5.

Don't Fear Those Fives!

1. Working with a partner, identify the multiples of 5 by counting by 5's. List the first ten numbers you count.
2. The following numbers are also multiples of 5:

95	525	3,555	215	905
6,220	390	1,000	10,765	885
7,505	123,415			

3. What pattern (s) do you observe in the multiples of 5.
4. State a rule you can use to determine if numbers are divisible by 5.
5. Using your rule, check the numbers from the following list that are divisible by 5. Verify your results on the calculator.

4,716	801	3,005	760	2,000

6. The number 30,475 is divisible by 5. By changing only one digit in this number, what other numbers can you make that are still divisible by 5? Can you change the 5 in the units place to some other digit and still have a number divisible by 5?
7. Can you write a number that is divisible by 2 and 5?

Super Simple Sixes

1. Working with a partner list the first 10 multiples of 6.
2. The following numbers are also multiples of 6:

534	318	378	2,268	13,608
81,648	1,368	8,208	49,248	30,054
180,324	1,081,944			

3. What pattern (s) do you observe in the multiples of 6? (Hint: Recall that 6 is 2x3).
4. State a rule you can use to determine if numbers are divisible by 6.
5. Using your rule, check the numbers from the following list that are divisible by 6. Verify your results on the calculator.

32,333	16,416	11,424	813	8,316

6. Find a number that is divisible by 2, 3, 4, 5, and 6. Is this the smallest number possible? Explain how you found this number. Would it be the same number as the smallest number divisible by 2, 3, 4, and 5? Why?

Nine's are Nifty!

1. Working with a partner list the first 10 multiples of 9.
2. The following numbers are also multiples of 9:

450	981	2,205	306	8,658
9,225	45,945	2,907	1,611	9,900
111,114	63,837			

3. Add up the digits in the multiples of 9 listed in step 2. For example, 450 is 4+5+0 = 9.
4. What pattern(s) do you observe in the multiples of 9?
5. State a rule you can use to determine if numbers are divisible by 9.
6. Using your rule, check the numbers from the following list that are divisible by 9. Verify your results with a calculator.

78,030	52,732	9,108	4,122	5,211

7. If a number is divisible by 9, is it also divisible by 3? Why? Can you find a number that is divisible by 9 that is not divisible by 3?
8. If a number is divisible by 3, is it also divisible by 9? Why? Can you find a number that is divisible by 3 that is not divisible by 9?

Tens Are Terrific!

1. Working with a partner, list the first 10 multiples of 10.
2. The following numbers are all multiples of 10:

300	290	710	970	2,000
8,300	11,280	7,600	10,000	

3. What pattern (s) do you observe in the multiples of 10?
4. State a rule you can use to determine if numbers are divisible by 10.
5. Using your rule, check the numbers from the following list that are divisible by 10. Verify your results on the calculator.

3,000	8,000	320	4,060	1,016

6. Are numbers divisible by 10 also divisible by 2 and 5? Why?
7. The number, 40, 709 is not divisible by 10. Switch the position of 2 digits in this number and create a number divisible by 10. What is this new number?

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