Just In Time Quick Check

Standard of Learning (SOL) 5.3a

Strand: Number and Number Sense

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The student will identify and describe the characteristics of prime and composite numbers.

Grade Level Skills:

- Identify prime numbers less than or equal to 100.
- Identify composite numbers less than or equal to 100.
- Demonstrate with concrete or pictorial representations and explain orally or in writing why a number is prime or composite.

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Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - 5.3a - Sieve of Eratosthenes: An Ancient Algorithm to Discover Prime Numbers (Word) / PDF
- VDOE Algebra Readiness Formative Assessments
  - SOL 5.3a (Word) / PDF
- VDOE Algebra Readiness Remediation Plans
  - Prime Numbers on 100-Grid (Word) / PDF
  - Prime or Composite? (Word) / PDF
- VDOE Word Wall Cards: Grade 5 (Word) | (PDF)
  - Prime Number
  - Composite Number
- Desmos Activity
  - Prime Time Double Digits

Supporting and Prerequisite SOL: 4.5a

SOL 5.3a - Just in Time Quick Check

1. Circle the numbers below that are prime.

   21 3 18 51 2 17 6 1 91

2. Which set of numbers contains two composite numbers and one prime number? Explain your thinking.
   a) 12, 2, 31
   b) 1, 5, 40
   c) 55, 23, 12
   d) 53, 41, 19

3. Draw a model that shows 7 is a prime number. Explain your thinking.

4. Draw a model that shows 12 is a composite number. Explain your thinking.

5. Look at the statements below. Circle all statements that are true.

A prime number has exactly two factors.
All odd numbers are prime.
All even numbers are composite.
A composite number has more than two factors.
A prime number has more than two factors.

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Common Errors/Misconceptions and their Possible Indications

1. Circle the numbers below that are prime

   21 3 18 51 2 17 6 1 91

   Some students may have the misconception that all prime numbers must be odd or that all odd numbers are prime. These students may benefit from starting at the concrete level, building arrays to model prime and composite numbers. As students build arrays, teachers may wish to highlight the idea that prime numbers will only have one way to build the array since they only have 2 factors (the array can be built with two orientations – vertically or horizontally, but there will only be one way to build it). Composite numbers will have more than one way to build an array. As students build arrays, encourage them to build an array for the number 1. This should lead them to discover that 1 has only 1 factor, so it is neither prime nor composite. Students also could draw pictorial models using grid paper to demonstrate whether a number is prime or composite.

   Divisibility rules may also be useful as students explore prime numbers. If using a calculator with students, teachers may wish to discuss why a decimal answer represents a remainder when students are testing the divisibility rules.

2. Which set of numbers contains two composite numbers and one prime number? Explain your thinking.
   a) 12, 2, 31
   b) 1, 5, 40
   c) 55, 23, 12
   d) 53, 41, 19

   Some students may have the misconception that all odd numbers are prime and all even numbers are composite. As a result, students may choose option A because it contains two even numbers and one odd number. These students may make the common error of not realizing that 2 is the only prime number that is even.

   Students may benefit from exploring prime and composite numbers using factor trees with both even and odd numbers. Ask them to explain patterns with certain numbers being composite, for example, all even numbers except for two is composite because they are all divisible by two. Two is not composite because it has exactly two different factors. Ask the students what other patterns they find while creating factor trees (example could be that multiples of 3 and multiples of 5 are composite).

3. Draw a model that shows 7 is a prime number. Explain your thinking.

   If a student is unable to answer this question correctly, they may not have a concrete or pictorial understanding of prime and composite numbers. Students should be able to demonstrate and have practice representing these numbers as a model. Students can practice by showing a rectangular model or rectangular array on grid paper. Prime numbers can be represented by only one array while composite numbers can be shown with two or more arrays.

4. Draw a model that shows 12 is a composite number. Explain your thinking.

Similar to the previous question about a prime number, if students are unable to answer this question correctly, they may not have a concrete or pictorial understanding of prime and composite numbers. Students may benefit from using tiles to create arrays, determining the factors of numbers, before moving on to grid paper or other pictorial representations of arrays.

5. Look at the statements below. Circle all statements that are true.

A prime number has exactly two factors.
All odd numbers are prime.
All even numbers are composite.
A composite number has more than two factors.
A prime number has more than two factors.

Some students may have the misconception that all odd numbers are prime or that all even numbers are composite. They also may not understand that a composite number is a natural number that has other factors than 1 and itself and that a prime number is a natural number that has exactly two different factors, 1 and itself.

These students may need to focus on building understanding with concrete materials or they may benefit from using a calculator to help with creating factor trees for several odd numbers. As students work on creating factor trees, they will be able to sort the numbers based on whether they are prime or composite and then they may wish to look for patterns in the prime numbers.