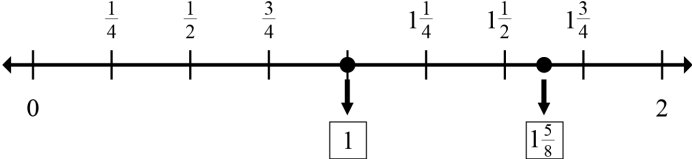
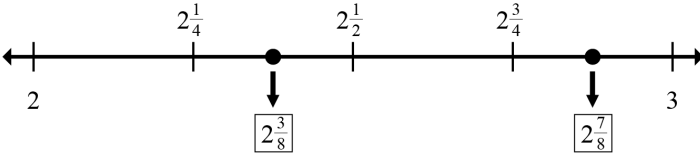
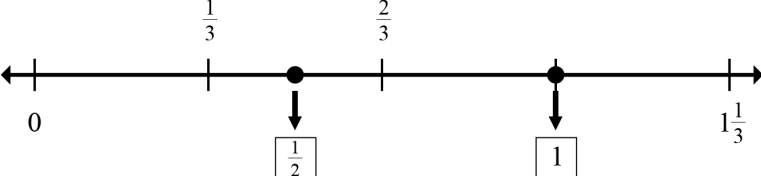


# Guide for Probe: Label the Missing Points on the Number Line

## Understandings and Successful Approaches

Correct Answers:

1.	
2.	
3.	

Students who find each of these correct answers and have explanations that support their choices may be applying the following:

- understanding that the points represents numbers and that each has one discrete location on a number line;
- ability to determine the whole based on the labels provided (i.e., the interval from 0 to 1 or 2 to 3 or  $\frac{1}{4}$  to  $1\frac{1}{4}$ ); and
- ability to reason about the size of the intervals of the whole, recognizing that these intervals must be of equal size.
- ability to determine the fraction that represents a point on a number line, including identifying points that are between hashmarks

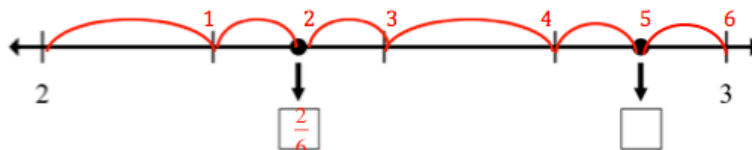
## Potential Common Misunderstandings/Misconceptions to Look For

The structure of this probe is “open” meaning that students are not provided with a list of possible answers from which to choose from. Instead they must fill in blank boxes by using the information on the number line to determine the fraction that names each of the points.

Because of the probe’s open structure, students may have a wide variety of incorrect answers. Common student misconceptions and difficulties are described below:

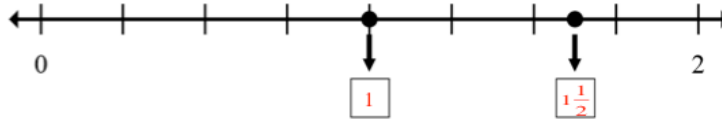
### 1. “Incorrect Counting” Misconception

- **Counting On:** Students with this misconception often apply whole number reasoning by simply using the value of the numerator to count on from the starting point without considering which fractions the hash marks represent or the size of the intervals between them.



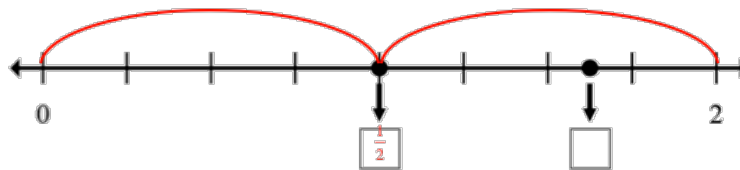
## 2. "Incorrect Use of Benchmarks" Misconception

- Incorrectly naming a fraction as a benchmark, such as 0,  $\frac{1}{2}$ , or 1
  - For example, in problem #1, students may correctly name the 1<sup>st</sup> point 1 but then incorrectly name the 2<sup>nd</sup> point  $1\frac{1}{2}$ .



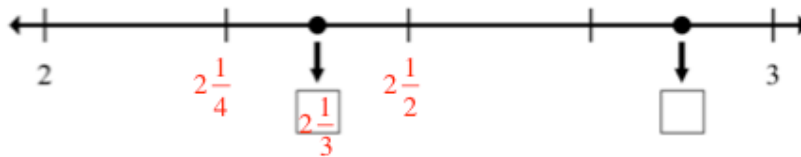
## 3. "Misapplying Part-Whole Thinking" Misconception

- Students may confuse location with part-whole concepts. For example, they may locate  $\frac{1}{2}$  as the distance to the midpoint of the number line rather than as the location of the number  $\frac{1}{2}$ .



## 4. Other Difficulties:

- Difficulty identifying points that are between two hashmarks.  
For example: students may recognize and label benchmarks such as  $\frac{1}{4}$  and  $\frac{1}{2}$  but then incorrectly apply whole number reasoning to determine the fraction in between.



- Forgetting to look at the endpoints and assuming that the number line goes from 0 to 1.  
For example, students may name the fractions below as if the line was labeled from 0 to 1.

