Drawing Inferences from Random Sampling

Statistics is math that deals with collecting, analysing, interpreting, and presenting data

- Population - entire group
- Sample - part of the population
- Random sample - part of the population that mimics the population

Lesson Goals (Academic)

- We will use random sampling to draw inferences about a population.(7.SP.A)
  - We will answer real-world questions to understand that statistics can be used to
    - gain information about a population by examining a sample of the population
    - make generalizations about a population from a sample and that they are valid only if the sample is representative of the population
  - We will answer real-world questions to understand that random sampling tends to produce representative samples and support valid inferences

Lesson Goals (Socio-Emotional)

- We will work in learning teams to
  - Make sense of problems and persevere in solving them (SMP.1)
  - Construct viable arguments and critique the reasoning of others (SMP.3)
  - Attend to precision (SMP.6)

Three Reads Protocol

Each person will read their card 3 times *before* everyone begins to solve

1st Read
    Goal: Comprehend Text

2nd Read
    Goal: Analyze and discuss

3rd Read
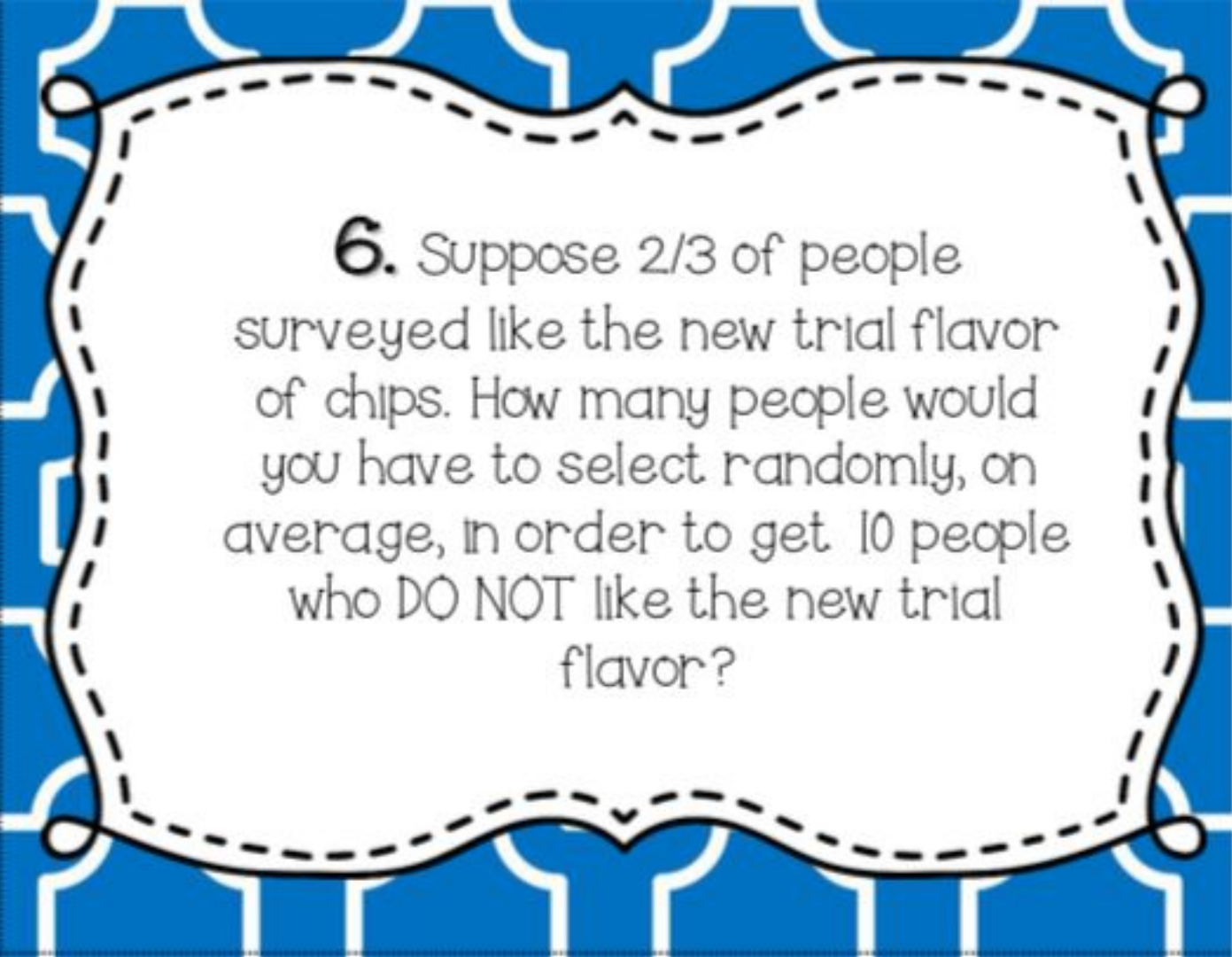   Goal: Brainstorm ways to solve

Recognizing Valid Samples

You can create and recognize valid samples of larger populations by making sure the sample meets 3 criteria.

Random	Representative	Adequate
A *random survey* ensures that every item/person has an equal chance of being chosen.	A *representative* sample selects data and/or members from the population to be represented.	An *adequate* sample size includes a sufficient number of data points/participants.
Example: drawing a number out of a hat Non-Example: Choosing the 1st 3 people you see	Example: surveying students about opinions of cafeteria food Non-Example: surveying a group of girls about what boy sports should be added to your school	Example: The sample is approximately 20% or larger of the population Non-Example: The sample size is about 5% of the population

Team Member C

- You are responsible for reading and sharing cards 3, 6, 9, 12, 15, 18
- When it is your turn, you will:
    - 1 - Share your screen
    - 2 - Read the card aloud and ask for any word clarifications from the team
    - 3 - Read again and summarize the card in your own words with support from the team if needed
    - 4 - Read once more and lead the discussion on how to solve the problem (what is needed, where to start)
    - 5 - Give time for everyone to solve the problem, and lead the discussion for the solution

3. In a sample of voters in Harrisburg, 18 out of 25 favored creating a new shopping center. If 50,000 people vote in the next Harrisburg election, how many are likely to vote in favor of the new shopping center based on this sample?

6. Suppose 2/3 of people surveyed like the new trial flavor of chips. How many people would you have to select randomly, on average, in order to get 10 people who DO NOT like the new trial flavor?

9. In a recent poll to measure Hugo's progress in his election campaign, 74 out of 150 people in the random sampling support him in his efforts. What is the best conclusion based on the polls?

A. Hugo is in a close race.

B. Hugo is going to win the election.
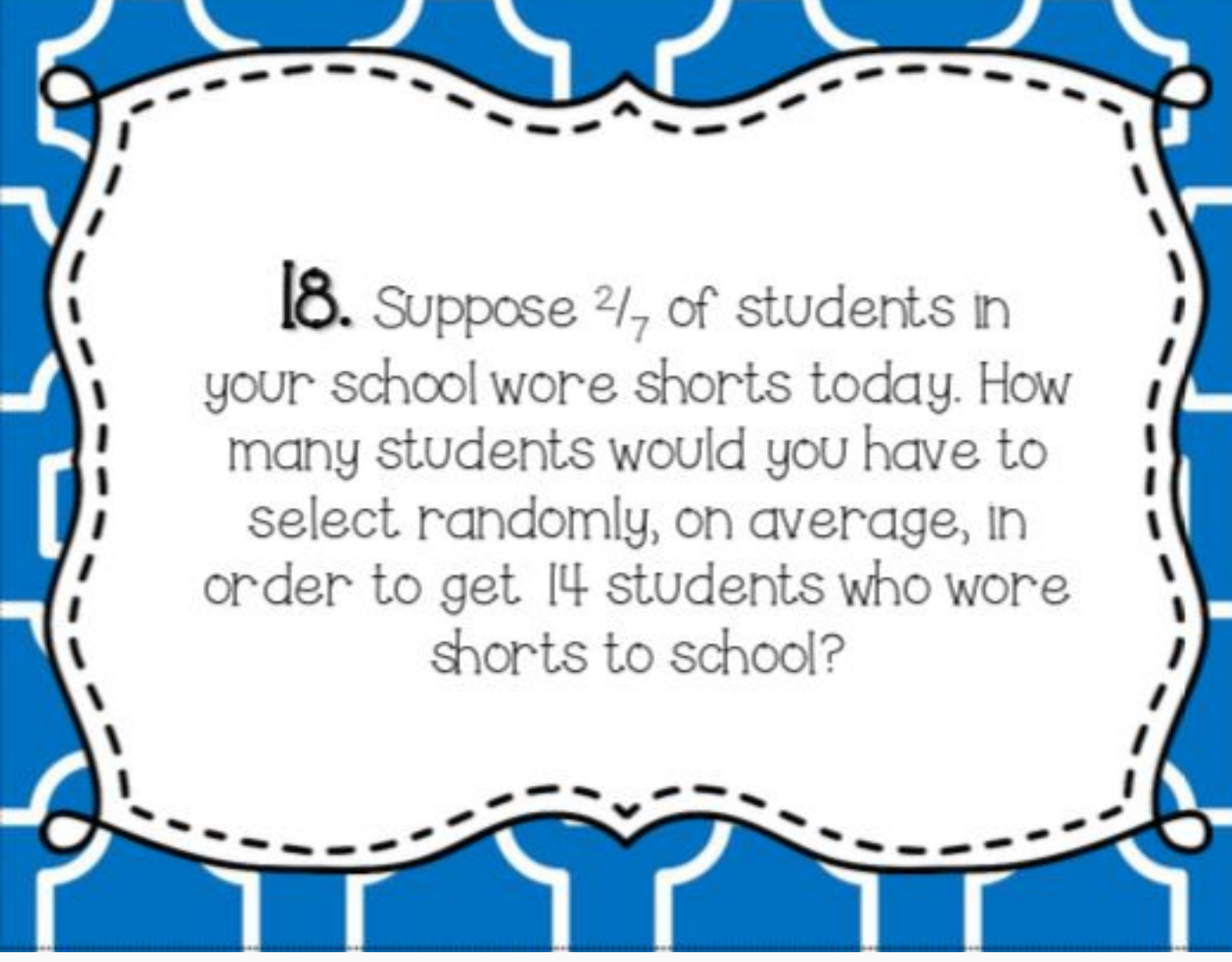
C. Hugo is going to lose the election.

12. A large bag of candy contains 500 M&M's. A random sample of 10 M&M's contains 2 yellow M&M's, 1 green M&M, 3 red M&M's, 2 brown M&M's, 1 orange M&M, and 1 blue M&M's. What is the best estimate of the total number of brown M&M's in the bag?

15. Which group would be a good random sample of people in a city?

A. Posting flyers at all of the gas stations in the city asking for participants.

B. Selecting 20 people at random from the local mall and grocery stores.

C. Choosing every 20th person from the city's most recent census register

18. Suppose $2/7$ of students in your school wore shorts today. How many students would you have to select randomly, on average, in order to get 14 students who wore shorts to school?