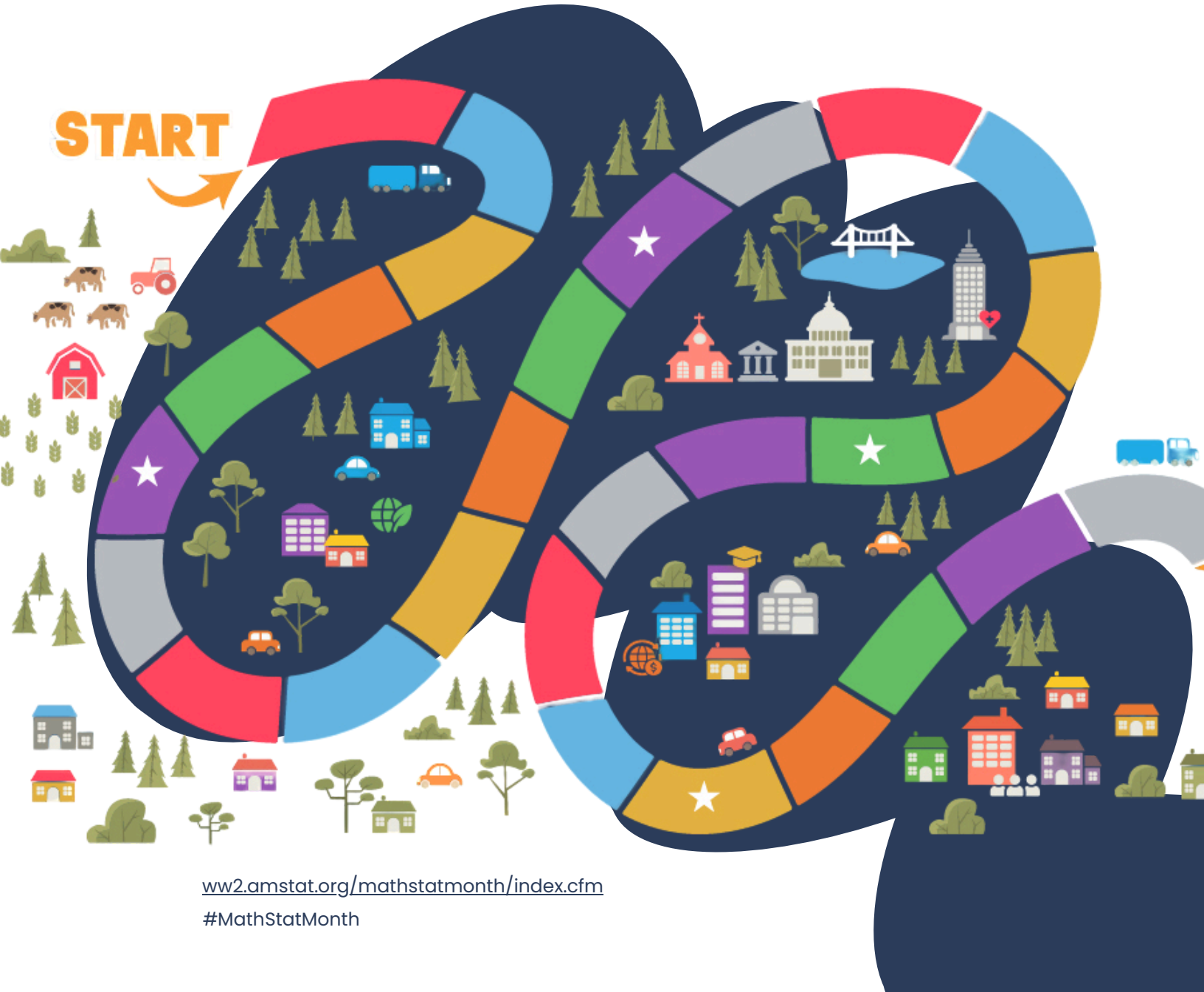
MSAM
Mathematics & Statistics Awareness Month

How to Play
The Community Game
Rules & Questions



ww2.amstat.org/mathstatmonth/index.cfm

#MathStatMonth

The Community Game

How to Play

Take a trip through your community and discover how statistics power everyday life!

Players

- 2–6 players
- 1 game master (reads questions and confirms answers)

Setup

1. Choose one player to be the **game master**.
2. Each player selects a distinct game piece (coins work well).
3. All players place their pieces at the **start of the data road**.
4. Players take turns in **clockwise order**, beginning with the first player to the game master's left.

Gameplay

- The game master asks **one question per turn**.
- If a player answers correctly, they move **forward 3 spaces**.
- If a player answers incorrectly, they move **back 2 spaces**.

Special Rules

- If a player is at the start and answers incorrectly, they remain at start (they do not move backward).
- If a player lands on a **bonus square (★)**, they immediately take another turn.
- Multiple players may occupy the same space.

Winning the Game

- The first player to **land on or move past** the "winner" space (orange triangle) is declared the winner.

Questions

PUBLIC HEALTH AND SAFETY

1. A town reports 300 flu cases this year and 250 last year. The population also increased. What would help you decide if flu is spreading more?
A. Compare flu cases per 1,000 residents
B. Count how many hospitals opened
C. Look at average temperature
D. Compare number of schools
Answer: A
Rationale: Rates adjust for population size, allowing fair comparisons.

2. If testing decreases, reported disease cases may:
A. Automatically rise
B. Be undercounted
C. Double
D. Stay identical
Answer: B
Rationale: Fewer tests can lead to fewer detected and reported cases.

3. Emergency response times vary a lot because one storm caused major delays. Which measure would better represent "typical" response time?
A. Maximum time
B. Mean (average)
C. Median
D. Total calls
Answer: C
Rationale: The median is less affected by extreme delays.

4. If 80 out of 100 people are vaccinated, vaccination coverage is:
A. 8%
B. 80%
C. 0.8%
D. 180%
Answer: B
Rationale: 80 out of 100 equals 80%.

5. A rise in reported food poisoning after a new online reporting form is introduced could mean:
A. Food is less safe
B. Reporting improved
C. Fewer people got sick
D. Restaurants closed
Answer: B
Rationale: Better reporting can increase recorded cases even if risk is unchanged.

6. Tracking monthly health data can reveal seasonal patterns.
Answer: True
Rationale: Monthly data can show repeating patterns across the year.

7. The average is always the best way to describe health data.
Answer: False
Rationale: Outliers can distort the mean.

8. If the population grows but cases stay the same, the disease rate may decrease.
Answer: True
Rationale: The same number of cases spread across more people lowers the rate.

9. One unusual year is enough to prove a long-term health trend.
Answer: False
Rationale: Trends require multiple years of data.

10. Comparing rates instead of totals helps make fair comparisons between places.
Answer: True
Rationale: Rates adjust for differences in population size.

INFRASTRUCTURE AND TRANSPORTATION

1. Bus ridership increased 5%, but the city's population increased 10%. What does this suggest?
A. Bus use per person likely decreased
B. Bus use per person likely increased
C. Everyone rode the bus
D. Data cannot be compared
Answer: A
Rationale: Population grew faster than ridership, so per-person ridership likely fell.

2. Two neighborhoods have the same number of accidents. One has twice as much traffic. Which is likely safer per driver?
A. The one with more traffic
B. The one with fewer traffic lights
C. They are equally safe
D. Not enough information
Answer: A
Rationale: Same accidents with more traffic means a lower accident rate.

3. If average commute time increases but median stays similar, this suggests:
A. All commuters are delayed
B. A few extreme delays increased
C. Traffic disappeared
D. Data are incorrect
Answer: B
Rationale: A few long delays can raise the mean without changing the median much.

4. Why might a city use "average daily traffic" when planning road repairs?
A. To pick road colors
B. To estimate wear and prioritize busy roads
C. To decide school boundaries
D. To measure rainfall
Answer: B
Rationale: Roads with heavier use often wear out faster and may need earlier repair.

5. Energy use rising faster than population suggests:
A. Efficiency improved
B. Usage per person increased
C. Fewer households exist
D. The city got smaller
Answer: B
Rationale: Faster growth than population implies per-person usage increased.

6. More total accidents always means a road is more dangerous.
Answer: False
Rationale: Total accidents don't account for how much traffic uses the road.

7. Data collected over time can show patterns like rush hour traffic.
Answer: True
Rationale: Time-based data reveals repeating patterns.

8. Comparing neighborhoods may require adjusting for population size or traffic volume.
Answer: True
Rationale: Rates allow fair comparisons across different sizes.

9. One day of traffic counts is enough to understand long-term traffic trends.
Answer: False
Rationale: Long-term trends require repeated measurements.

10. Standardized measures (like "per mile" or "per vehicle") help compare areas fairly.
Answer: True
Rationale: Standardization makes comparisons consistent across places.

EDUCATION

1. A school's average score increased, but only top students tested. This means:
A. All improved
B. Test was easier
C. Results may not represent everyone
D. Enrollment doubled
Answer: C
Rationale: If only certain students test, results may not reflect all students.

2. Two schools have the same average score, but one has more spread. This means:
A. More varied scores
B. Better school
C. Worse school
D. Same results
Answer: A
Rationale: Greater spread means scores vary more widely.

3. Graduation rate is best expressed as:
A. Total diplomas
B. Percent completing
C. Teacher count
D. Classroom count
Answer: B
Rationale: A rate compares the number graduating to the total number of students.

4. A survey of only honor students would likely be:
A. Representative
B. Biased
C. Accurate for all
D. Random
Answer: B
Rationale: It does not represent the full student population.

5. If both mean and median rise, this suggests:
A. Overall improvement
B. Only top improved
C. Only low improved
D. No change
Answer: A
Rationale: When both measures increase, performance likely improved broadly.

6. Comparing student groups can help identify achievement gaps.
Answer: True
Rationale: Breaking data into groups shows differences between them.

7. If two schools have the same average, they have identical results.
Answer: False
Rationale: They could have different score distributions.

8. All averages describe data equally well.
Answer: False
Rationale: Mean and median may tell different stories depending on the data.

9. A representative sample reflects the larger student population.
Answer: True
Rationale: A representative sample mirrors the broader group.

10. Less spread in scores means students performed more similarly.
Answer: True
Rationale: Smaller variation means scores are closer together.

LOCAL ECONOMY

1. If unemployment falls but fewer people are job searching, this might mean:
A. Everyone found jobs
B. Some stopped looking
C. Wages doubled
D. Population fell
Answer: B
Rationale: People not searching are not counted as unemployed.

2. Why report median income instead of average?
A. Makes income higher
B. Reduces effect of outliers
C. Includes more people
D. Counts taxes
Answer: B
Rationale: Median is less affected by extremely high incomes.

3. Prices rising over time is called:
A. Inflation
B. Recession
C. Correlation
D. Migration
Answer: A
Rationale: Inflation refers to increasing prices over time.

4. Per capita income divides total income by:
A. Area
B. Businesses
C. Population
D. Taxes
Answer: C
Rationale: Per capita means “per person.”

5. If housing prices rise but wages do not, affordability likely:
A. Improves
B. Decreases
C. Doubles
D. Stays identical
Answer: B
Rationale: Rising prices without wage growth reduce affordability.

6. Total income tells how much the average person earns.
Answer: False
Rationale: Total income does not account for population size.

7. Adjusting for inflation helps compare values over time.
Answer: True
Rationale: It accounts for changes in purchasing power.

8. Inflation makes money worth more over time.
Answer: False
Rationale: Inflation reduces purchasing power.

9. Percentages are often better for comparison than raw totals.
Answer: True
Rationale: Percentages adjust for population size differences.

10. If median income rises, every resident earns more.
Answer: False
Rationale: The median reflects the middle value, not every individual.

ENVIRONMENT AND SUSTAINABILITY

1. Climate trends require data collected over:
A. Days
B. Weeks
C. Years or decades
D. Hours
Answer: C
Rationale: Climate patterns are identified using long-term data.

2. Recycling 300 of 1,000 tons equals:
A. 3%
B. 30%
C. 300%
D. 0.3%
Answer: B
Rationale: 300 divided by 1,000 equals 30%.

3. Comparing tree canopy across neighborhoods requires:
A. Spatial data
B. Bus counts
C. Income totals
D. Test scores
Answer: A
Rationale: Spatial data shows geographic differences.

4. If air quality improves after traffic restrictions, this suggests:
A. Weather ended
B. No connection
C. Random guessing
D. Possible relationship
Answer: D
Rationale: It suggests an association but does not prove cause.

5. Year-to-year rainfall changes are examples of:
A. Climate
B. Short-term variation
C. Population trends
D. Inflation
Answer: B
Rationale: Weather can vary from year to year.

6. One hot summer proves climate change.
Answer: False
Rationale: Climate trends require long-term evidence.

7. Long-term data help detect environmental trends.
Answer: True
Rationale: Patterns appear over many years of data.

8. Air quality can be summarized with an index.
Answer: True
Rationale: Indexes combine measurements into one rating.

9. One unusual year defines a long-term climate pattern.
Answer: False
Rationale: Trends require consistent data over time.

10. Data dashboards can help visualize environmental trends.
Answer: True
Rationale: Visual displays make patterns easier to see.

CIVIC ENGAGEMENT

1. A survey showing 60% ± 5% support means:
A. Exactly 60%
B. Likely between 55% and 65%
C. Wrong survey
D. 5% changed votes
Answer: B
Rationale: The margin of error creates a likely range.

2. Larger survey samples usually result in:
A. Larger error
B. Higher turnout
C. Fewer responses
D. Smaller error
Answer: D
Rationale: Larger samples reduce sampling variability.

3. Voter turnout is best reported as:
A. Total voters
B. Ballot color
C. Percent of eligible voters
D. Weather
Answer: C
Rationale: Percentages allow fair comparisons.

4. Surveying only one neighborhood to represent a city is likely:
A. Representative
B. Biased
C. Random
D. Precise
Answer: B
Rationale: It may not reflect the full population.

5. Margin of error applies to:
A. Survey estimates
B. Census counts

C. Weather reports
D. Budgets
Answer: A
Rationale: It reflects uncertainty in survey results.

6. Larger samples usually reduce margin of error.
Answer: True
Rationale: Bigger samples reduce random variation.

7. Random samples reduce bias compared to convenience samples.
Answer: True
Rationale: Random selection improves fairness.

8. Total GDP shows how evenly income is distributed.
Answer: False
Rationale: GDP measures total output, not distribution.

9. Data transparency can increase public trust.
Answer: True
Rationale: Openness builds understanding and trust.

10. One survey proves permanent public opinion trends.
Answer: False
Rationale: Trends require repeated measurement over time.

SOCIAL SERVICES

1. A food pantry serving 500 families in a city of 10,000 equals:
A. 0.5%
B. 500%
C. 50%
D. 5%
Answer: D
Rationale: 500 divided by 10,000 equals 5%.

2. Surveying only park visitors to measure satisfaction may:
A. Be representative
B. Be biased
C. Eliminate error
D. Increase turnout
Answer: B
Rationale: Park visitors may not represent all residents.

3. Tracking service use monthly helps identify:
A. Random guessing
B. School mascots
C. Seasonal patterns
D. Building colors
Answer: C
Rationale: Monthly data can reveal repeating patterns.

4. Participation rates are best expressed as:
A. Raw totals
B. Percent of eligible population
C. Budgets
D. Weather
Answer: B
Rationale: Rates compare part of a group to the whole.

5. A representative sample of residents helps ensure:
A. Fair representation
B. Equal funding
C. Fewer surveys
D. Higher taxes
Answer: A
Rationale: Representative samples reflect the broader population.

6. Surveys can be biased depending on who responds.
Answer: True
Rationale: If some groups respond more than others, results can be skewed.

7. Small samples always represent a population accurately.
Answer: False
Rationale: Small samples increase the chance of error.

8. Data dashboards help visualize service trends.
Answer: True
Rationale: Visual displays make patterns easier to understand.

9. Participation rates compare part of a group to the whole group.
Answer: True
Rationale: Rates show how much of the total group participates.

10. Community needs assessments rely only on guesswork.
Answer: False
Rationale: Needs assessments use collected data to guide decisions.