

Questions That Change

Track how researchers refine an inquiry and combine evidence.

CCSS.ELA-Literacy.WHST.11-12.7 “Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject...”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the words that show the inquiry changing, circle each data record or source, and number 1, 2, and 3 beside the revised question, the evidence choices, and the next research step.

Mapping Heat at Bus Stops

- ① At first, a student team asked, “Which downtown bus stops are hottest after school?” For one week, they visited six stops at 3:30 p.m. and recorded air temperature, surface temperature, cloud cover, and the number of people waiting. Their pilot table showed that a stop beside a wide road was warmer than a stop under mature trees. Yet the team could not tell whether shade or the ground beneath the shelter caused the difference. The pilot raised a more useful question. It also revealed that their first question was too broad for a useful explanation.
- ② To revise the inquiry, the team asked, “How do shade and ground material at downtown bus stops affect air and surface temperatures after school?” They added a shade estimate, using photographs at each visit, and recorded whether each measured surface was asphalt, concrete, grass, or metal. They also measured the same surface types at comparable times on ten clear days. A city tree-canopy map identified blocks with low and high canopy cover. A university extension article explained that pavement absorbs and stores solar energy, while shade reduces direct solar heating. These sources helped the team decide what observations to collect, rather than supplying an answer before the study.
- ③ After organizing their records, the team found that, at stops with little shade, asphalt surfaces averaged 14°C warmer than nearby shaded grass. Air temperatures at those stops differed by only 3°C. The team synthesized this pattern with the canopy map and extension article: unshaded pavement likely raises surface heat, but the data could not separate material from shade at every stop. For a longer project, they would add stops with the same material but different shade and compare morning, afternoon, and evening. If city planners needed a quick planting priority list, the team could narrow the inquiry to low-canopy stops with high afternoon surface readings.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 How did the team revise its original question, and what problem in the pilot study led to that revision?

2 What new records did the team collect so it could investigate ground material as well as shade?

3 How did the tree-canopy map and the university extension article contribute different kinds of information to the investigation?

4 What conclusion does the team support, and what limitation prevents a stronger claim?

3 YOUR TURN _____ Your own words

Choose a researchable issue at your school. Write a four-sentence mini research plan: state a focused question, identify data you will record, name two sources and explain how you will synthesize them with your data, then explain one way you might narrow or broaden the inquiry.

PART 1 • READ AND MARK

Underline the words that show the inquiry changing, circle each data record or source, and number 1, 2, and 3 beside the revised question, the evidence choices, and the next research step. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How did the team revise its original question, and what problem in the pilot study led to that revision?	They changed from identifying the hottest stops to investigating how shade and ground material affect air and surface temperatures. The pilot did not show whether shade or ground material caused the temperature difference.
2	What new records did the team collect so it could investigate ground material as well as shade?	They added a shade estimate from photographs and recorded whether each measured surface was asphalt, concrete, grass, or metal.
3	How did the tree-canopy map and the university extension article contribute different kinds of information to the investigation?	The map identified blocks with low and high canopy cover, while the article explained how pavement and shade affect solar heating.
4	What conclusion does the team support, and what limitation prevents a stronger claim?	The evidence supports that unshaded pavement likely raises surface heat. The team could not separate the effects of material and shade at every stop.

PART 3 • YOUR TURN (SAMPLE ANSWER)

My question is: How does cafeteria noise affect students' self-reported ability to talk comfortably during lunch? I will record decibel readings, crowd size, table location, and anonymous comfort ratings. I will compare the school lunch schedule with a university acoustics guide, then synthesize both sources with my measurements to see whether busier periods match higher noise and lower ratings. If crowd size matters more than lunch period, I will narrow the study to the busiest lunch; if results differ by location, I will broaden it to the hallway outside the cafeteria.

Accept equivalent explanations that distinguish evidence collected by the team from information contributed by published or public sources. For the open task, accept varied school issues if the response includes all four required parts and proposes a reasonable change in scope.