A photograph of a single water drop hitting a calm lake at sunset. The drop is suspended in mid-air, creating a small splash. The background shows a bright orange and yellow sunset over a dark horizon.

ASKING QUESTIONS AND DEFINING PROBLEMS

- WHAT QUESTIONS WOULD HELP ME UNDERSTAND THE PHENOMENA?
- WHAT QUESTIONS WOULD HELP ME UNDERSTAND WHAT I'VE OBSERVED?
- WHAT QUESTIONS WOULD HELP ME EVALUATE MY EVIDENCE?
- WHAT QUESTIONS WOULD HELP ME INTERPRET MY EVIDENCE OR OBSERVATIONS?
- WHAT QUESTIONS WOULD HELP ME CLARIFY MY OBSERVATIONS, RESEARCH, OR EVIDENCE?



PLANNING AND CARRYING OUT INVESTIGATIONS

- WHAT QUESTIONS DO I NEED TO ASK ABOUT VARIABLES IN MY INVESTIGATION?
- WHAT QUESTIONS DO I NEED TO ASK ABOUT MY DATA? (HOW MUCH DATA DO I NEED? HOW ACCURATE IS MY DATA?)
- WHAT QUESTIONS DO I NEED TO ASK ABOUT SAFETY, ETHICS, OR THE ENVIRONMENT?
- WHAT QUESTIONS DO I NEED TO ASK ABOUT MANIPULATING VARIABLES IN MY INVESTIGATION?

A photograph of bright orange and yellow flames rising from a dark base, set against a dark background.

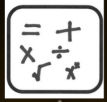
DEVELOPING AND USING MODELS

- WHAT QUESTIONS WOULD HELP ME DETERMINE WHAT TYPE OF MODEL MAY BE BEST?
- WHAT QUESTIONS WOULD HELP ME DESCRIBE AND/OR EXPLAIN ASPECTS OF MY MODEL?
- WHAT QUESTIONS MIGHT HELP ME EVALUATE MY MODEL OR OTHER MODELS SIMILAR TO MINE?
- WHAT QUESTIONS WOULD HELP ME UNDERSTAND LIMITATIONS TO MY MODEL?
- WHAT QUESTIONS WOULD HELP ME ANALYZE MY MODEL AND SUPPORT EXPLANATIONS OF WHAT IS BEING MODELED?

A photograph of a starry night sky with a dark silhouette of trees and mountains in the foreground.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

- WHAT QUESTIONS DO I NEED TO ASK ABOUT THE SCIENTIFIC OR PRIMARY SOURCE TEXTS I MIGHT USE TO OBTAIN SCIENTIFIC OR TECHNICAL INFORMATION?
- HOW CAN I UNDERSTAND AND SYNTHESIZE INFORMATION FROM MULTIPLE SOURCES?
- WHAT QUESTIONS DO I NEED TO ASK TO FIND OUT THE CREDIBILITY, ACCURACY, AND POTENTIAL BIAS OF THE SOURCES I USE?
- HOW CAN I USE A VARIETY OF MEDIA TO SHARE WHAT I LEARN?
- WHAT QUESTIONS DO I NEED TO ASK ABOUT THE AUDIENCE THAT WOULD BEST BENEFIT FROM WHAT I'VE LEARNED?



USING MATHEMATICS AND COMPUTATIONAL THINKING

- WHAT QUESTIONS DO I NEED TO ASK WHEN I DECIDE WHETHER TO USE QUANTITATIVE OR QUALITATIVE DATA?
- WHAT QUESTIONS DO I NEED TO ASK ABOUT DIGITAL TOOLS TO ANALYZE AND VISUALIZE LARGE DATA SETS?
- HOW CAN I USE MATHEMATICAL REPRESENTATIONS TO DESCRIBE SCIENTIFIC CONCLUSIONS AND DESIGN SOLUTIONS?
- HOW CAN I CREATE ALGORITHMS (SERIES OF ORDERED STEPS) TO SOLVE A PROBLEM?
- WHAT QUESTIONS DO I NEED TO ASK ABOUT MATHEMATICAL CONCEPTS OR PROCESSES I MIGHT USE?



ANALYZING AND INTERPRETING DATA

- WHAT QUESTIONS DO I NEED TO ASK ABOUT HOW I MIGHT VISUALIZE RELATIONSHIPS THROUGH GRAPHICAL DISPLAYS?
- WHAT QUESTIONS DO I NEED TO ASK ABOUT THE ANALYSIS AND INTERPRETATION OF THE EVIDENCE TO SUPPORT THE EXPLANATION OF PHENOMENA?
- HOW CAN I APPLY CONCEPTS OF STATISTICS LIKE MEAN, MEDIAN, MODE, AND VARIABILITY TO ANALYZE AND CHARACTERIZE DATA?
- WHAT QUESTIONS WOULD HELP ME IMPROVE THE ACCURACY OF DATA?
- WHAT QUESTIONS SHOULD I CONSIDER ABOUT THE LIMITATIONS OF DATA?
- WHAT QUESTIONS DO I NEED TO ASK ABOUT SIMILARITIES AND DIFFERENCES?



ENGAGING IN ARGUMENT FROM EVIDENCE

- WHAT QUESTIONS WOULD HELP ME FIND THE BEST EVIDENCE FOR CONSTRUCTING A SCIENTIFIC ARGUMENT ABOUT PHENOMENA?
- WHAT QUESTIONS WOULD HELP ME ANALYZE WHETHER DATA EMPHASIZES SIMILAR OR DIFFERENT EVIDENCE OR INTERPRETATIONS OF FACTS?
- HOW CAN I ELICIT DETAILS ABOUT EXPLANATIONS, PROCEDURES, MODELS AND QUESTIONS WHEN I PROVIDE OR RECEIVE FEEDBACK / CRITIQUES?
- WHAT QUESTIONS SHOULD I ASK ABOUT CONSTRUCTING OR PRESENTING AN ARGUMENT THAT SUPPORTS OR REFUTES AN EXPLANATION OF A PHENOMENON OR SOLUTION?



CONSTRUCTING EXPLANATIONS AND DESIGNING SOLUTIONS

- WHAT QUESTIONS SHOULD I ASK ABOUT RELATIONSHIPS BETWEEN VARIABLES THAT PREDICT OR DESCRIBE PHENOMENA?
- WHAT MODELS OR REPRESENTATIONS MIGHT I CONSTRUCT?
- WHAT QUESTIONS SHOULD I ASK ABOUT MULTIPLE SOURCES OF EVIDENCE IN MY EXPLANATIONS AND SOLUTIONS?
- HOW CAN I APPLY SCIENTIFIC REASONING TO SHOW WHY DATA OR EVIDENCE IS ADEQUATE?
- WHAT QUESTIONS SHOULD I ASK TO ENSURE MY WORK IS CONSISTENT WITH SCIENTIFIC IDEAS, PRINCIPLES, AND THEORIES?