NGSS Digital Interactive Notebook

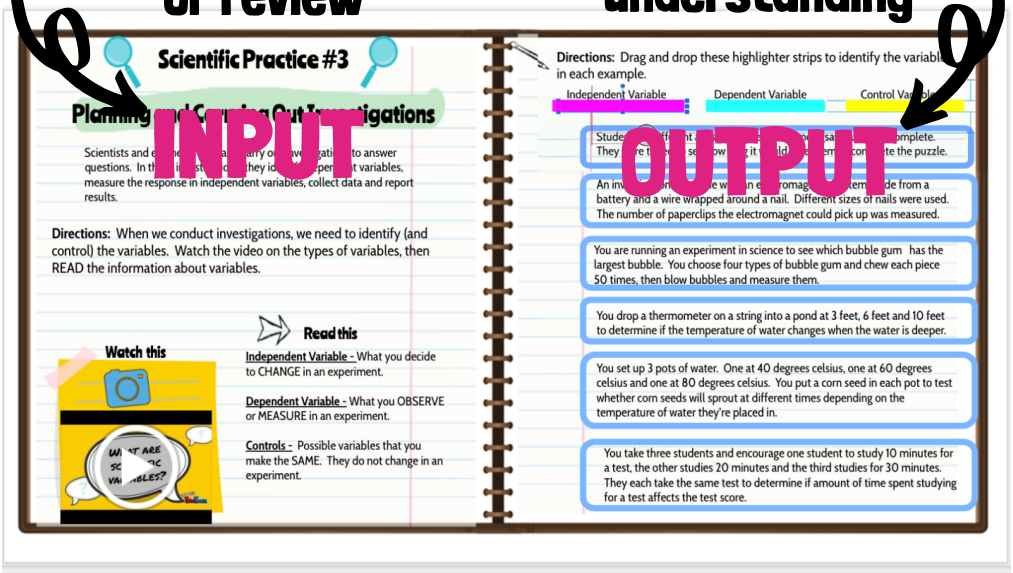
Design Guide

Using Your Smarticles

1 Design with an INPUT/OUTPUT structure in mind

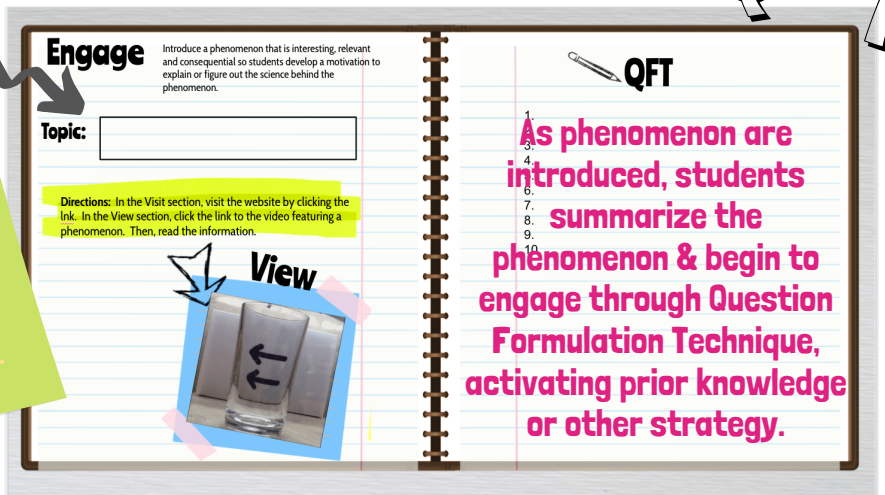
Information for students to read/view or review

Provide opportunities for students to demonstrate understanding



2 **ENGAGE** Provide students with phenomenon to view, consider or question.

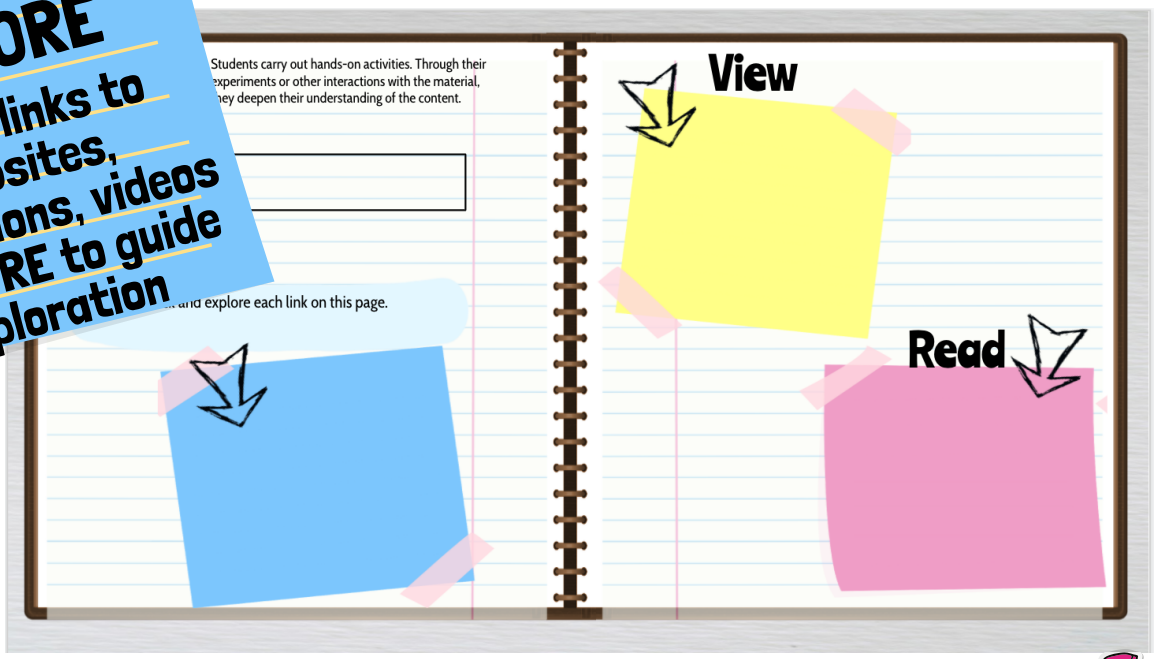
QFT



Tips and Guidelines (Continued)

3 EXPLORE

Insert links to websites, simulations, videos and MORE to guide exploration

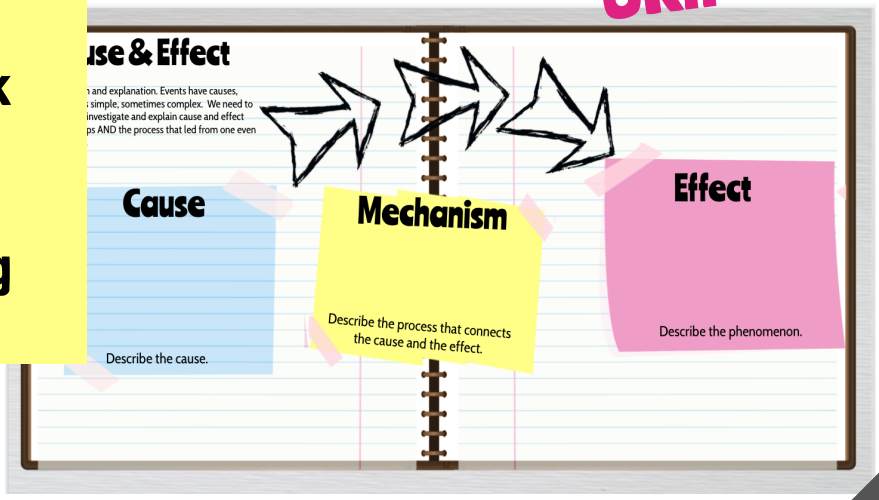


HOWEVER.....DON'T OVERLOAD YOUR PAGES!!

For students working remotely, unnecessary images on the page can put a strain on bandwidth and slow down loading. Additionally, special education students benefit from pages with a lighter information load.

Students need ROOM to record their work....the notebook should be a demonstration of THEIR understanding

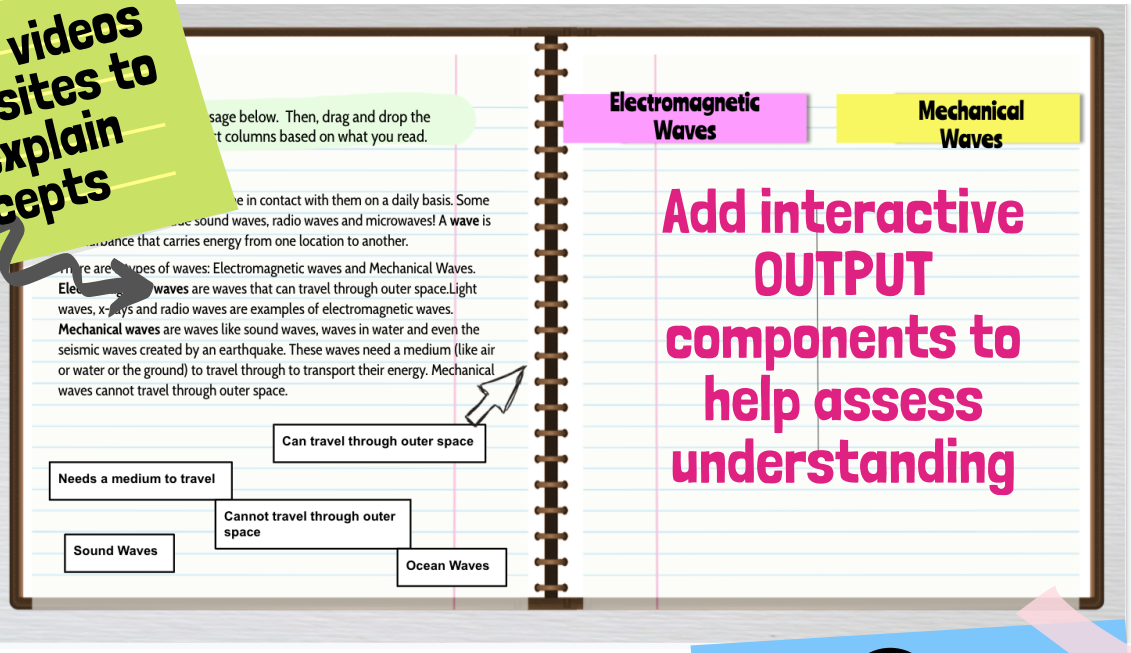
Blank space is OK!!



Tips and Guidelines (Continued)

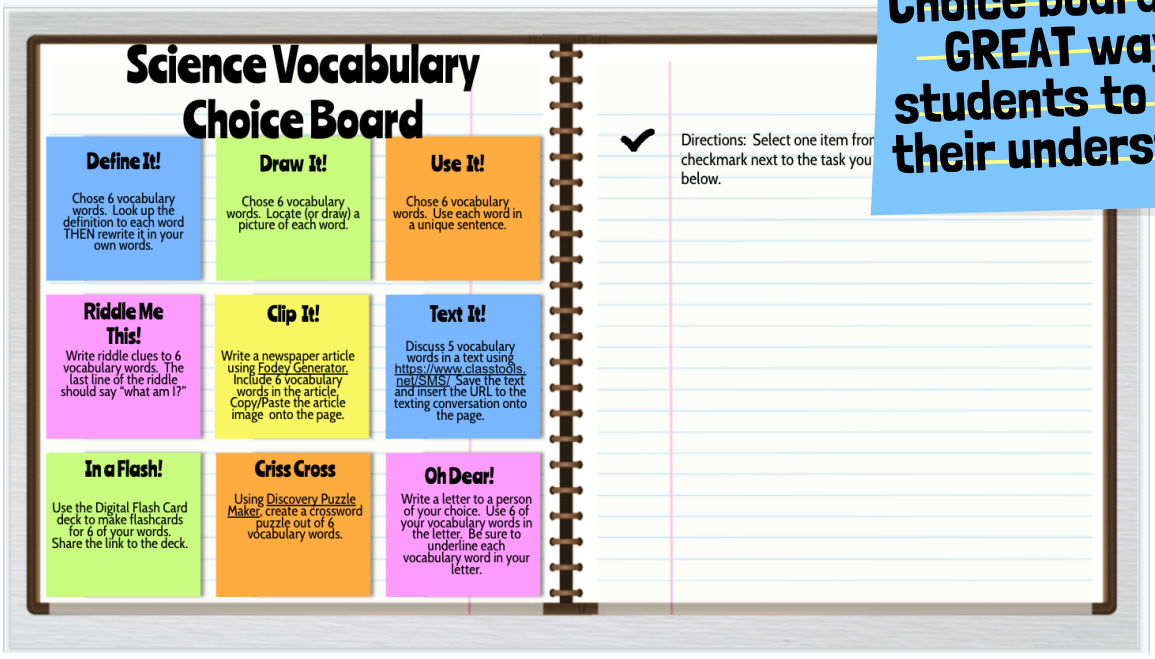
4 EXPLAIN

Use text, videos and websites to help explain concepts



5 ELABORATE

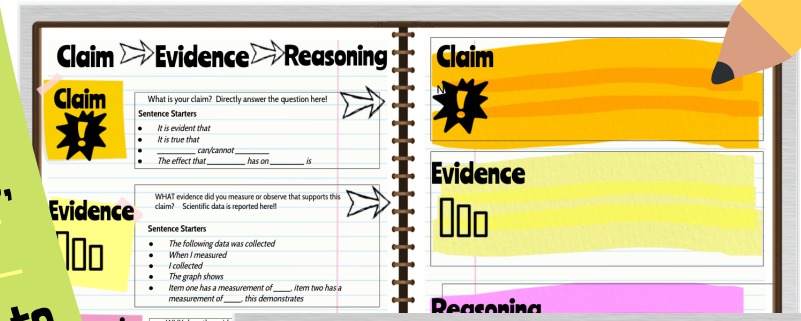
Choice boards are a GREAT way for students to expand their understanding

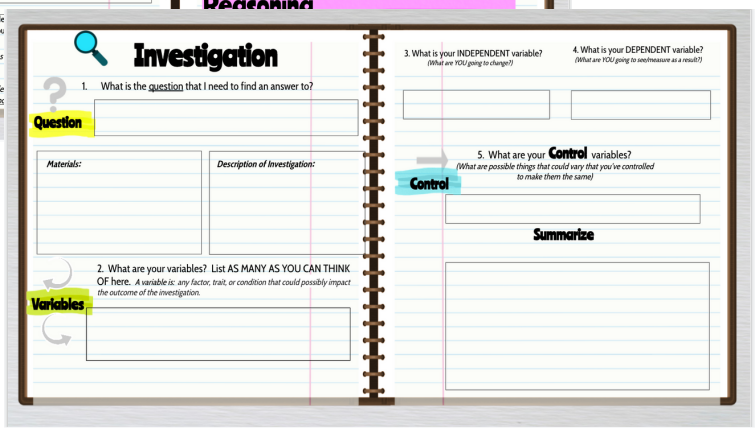


Tips and Guidelines (Continued)

6 EVALUATE

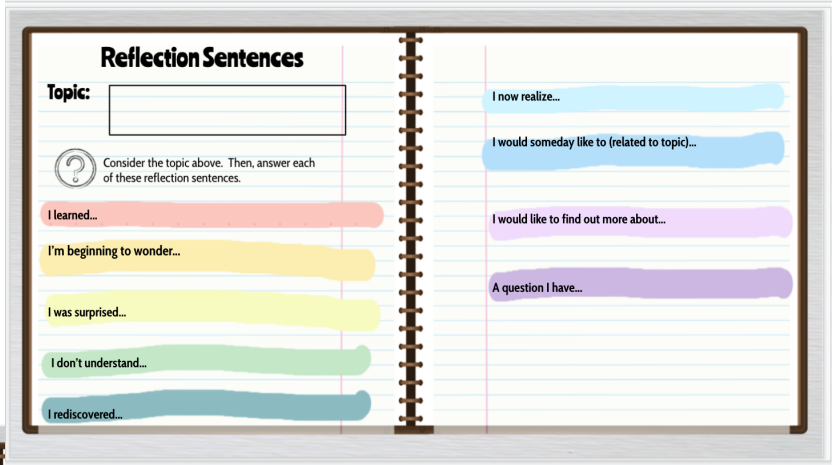
Link to Google Forms, Digital Exit Slips or include your own response elements to evaluate understanding





7 Self-Assess

Allow students opportunities to CREATE content in the notebook to develop it as their own resource tool and reflect on their learning



5E Instruction

Engage

Introduce a phenomenon that is interesting, relevant and consequential so students develop a motivation to explain or figure out the science behind the phenomenon.

Purpose/Goals

- determine students' current understanding about the phenomena
- invite students to raise their own questions about the process of scientific inquiry (QFT)
- encourage students to compare their ideas with those of others
- enable teachers to assess what students do or do not understand about the stated outcomes of the lesson.

Instructional Strategies

- [ ] Show a compelling video segment
- [ ] Discuss "big ideas" or concepts that students can relate to
- [ ] Pose big questions with complex explanations
- [ ] Sort and identify commonalities between items
- [ ] Present data that drives questioning

Explore

Students carry out hands-on activities. Through their experiments or other interactions with the material, they deepen their understanding of the content.

Purpose/Goals

- interact with materials and ideas through classroom and small-group discussions
- consider different ways to solve a problem or frame a question
- acquire a common set of experiences so that they can compare results and ideas with their classmates
- observe, describe, record, compare, and share their ideas and experiences
- express their developing understanding (modeling) of testable questions and scientific inquiry

Instructional Strategies

- [ ] Station work to explore components related to a larger idea
- [ ] Developing models
- [ ] Designing solutions using engineering design practices
- [ ] Conducting investigations and gather data
- [ ] Developing explanations for phenomenon Simulations

Explain

This is a teacher-led phase that helps students synthesize new knowledge and ask questions if they need further clarification.

Purpose/Goals

- explain concepts and ideas (in their own words)
- listen to and compare the explanations of others with their own
- become involved in student-to-student discourse in which they explain their thinking to others and debate their ideas
- revise their ideas; record their ideas and current understanding
- vocabulary formally introduced, when appropriate
- use labels, terminology, and formal language
- compare their current thinking with what they previously thought

Instructional Strategies

- [ ] Video explanations
- [ ] Gallery Walks
- [ ] Socratic Discussions
- [ ] Worksheets/practice problems
- [ ] Guided notes

5E Instruction

Elaborate

Forging the concept-to-self, concept-to-concept and concept-to-world connections that help tie anchor and investigative work together.

Purpose/Goals

- make conceptual connections between new and former experiences
- connect ideas, solve problems, and apply their understanding to a new situation
- use scientific terms and descriptions
- draw reasonable conclusions from evidence and data
- deepen their understanding of concepts and processes
- communicate their understanding to others.

Instructional Strategies

- ☐ Writing a Claim, Evidence, Reasoning report
- ☐ Creating a report on investigations
- ☐ Discussing solutions to engineering design challenges
- ☐ Creating finalized notes/claims based on models
- ☐ Creating extension projects
- ☐ Sharing/discussing results with peers

Playing games

Simulations

Evaluate

Students compare their previous understanding to their new knowledge. They are able to prove what they know in writing, conversation, and demonstration.

Purpose/Goals

- demonstrate what they understand about scientific inquiry and how well they can apply their knowledge to carry out their own scientific investigation and to evaluate an investigation carried out by a classmate
- share their current thinking with others
- assess their own progress by comparing their current understanding with their prior knowledge
- ask questions that take them deeper into a concept.

Instructional Strategies

- ☐ Projects
- ☐ Traditional assessment/quizzes
- ☐ Exit Slips
- ☐ Self-Reflection
- ☐ Peer Evaluation
- ☐ Presentations
- ☐ Investigative Reports