#NaturesWonder - What Made That? - #SciencingAndEngineering with @SciGalNielsen

Phenomenon Length Video: (2:33 min.)
Best Practice Video: coming soon!

Join STEMAZing Teacher Leader, Lisa Nielsen, as she notices and wonders about one of nature's wonders in southern Arizona's. There are so many amazing phenomena right outside your door. In this video you will learn to take a step back and look closer at nature's wonders. This activity only requires a paper, pencil, and your eagle eyes.

Supplies needed: Printed copies of photos, show photos in presentation, or access to Nature Mystery Phenomenon video

Engineering Extension: Check out the engineering design challenge at the end of this best practices guide which can be used as an extension to the Noticing and Wondering your students do. Supplies needed are simply scissors, yarn (or string or thread), branched sticks from a bush or tree (or straws or skewers), and tape of some kind.

Best Practices:

Regardless of which approach you use below, **students should always be given ample time to experiment, notice, and wonder before they are provided an explanation.** This video will encourage children to use the notice and wonder strategy. They are given time to first notice and then more time to wonder and ask questions. Encourage children to record and organize their thinking. For younger children, it may be more beneficial for them to do one type of thinking at a time. A "T" chart could help children notice patterns between observations and questions. Resist the urge to answer any questions during this time. Respond with questions back to students. Sample prompts: What do you think? Is that a researchable question? Where could we look to find the answer? What else are you wondering? Think about the whys and hows. This video leads students into a research investigation about what is causing the webs. Naturally, when we see webs we think of spiders. In this case, it is actually the tent caterpillar. Encourage them to look for answers and think about what they are observing in different ways and from different perspectives.

Notice Phenomenon and Wonder Question Journals in Google Classroom or Printed Out
Students have the opportunity to download or create a Google Classroom version of the Notice, Wonder, Learn Journal. You can push the link out into the classroom or make a copy of the journal and put it in your Google classroom making sure you make a copy for each student to complete. Choose the journal that best fits your needs.

You can find versions of the Notice, Wonder, Learn Journal here: https://stemazing.org/notice-wonder-learn-journal/
NOTE: For the PDF printable version, be sure to print it double sided and flipped along the SHORT EDGE.

Three Approaches for Using Sciencing and Engineering Video:
1) Have students watch the video, pausing to make observations and generate questions. Let students decide how they want to record their thinking. Students follow up by researching their questions.
Estimated time: Self-paced by students. 3 min video followed by student-led investigation

2) Teachers/Parents can watch the video and then facilitate the notice and wonder process with their children. Use the pictures in your own format and style. Probe children for more in depth questioning. Offer space or resources to research and answer questions.
Estimated Time: Depends on your pace.

RECOMMENDED APPROACH
3) Use the Notice Phenomenon and Wonder Question Journal where the notice and wonder prompts are separated for maximum depth. Make sure children are recording their answers to the two most important questions in science: What do you notice? What do you wonder? while they are interacting with the video. Pause video and encourage them to write as many thoughts as they can. Prompt if students get stuck. They should have multiple noticings and wonderings. After the video ends, have children reflect on their questions. Which ones will they need to investigate? Can any questions be combined to form a bigger question? Can one big question be used to answer any other questions they have? Allow children to explore the answer to their questions using research strategies. Children should record information about what they find and then draft claims based on evidence to answer their questions. Ask them to defend the answers to their questions using research based evidence.
Estimated Time: depends on how many questions and how much research students do.

Using Explanations and Extensions:
In this section, you will be able to find resources to help answer the question, What is in the tree and what made them? Remember, best practice would have you engage the students with the phenomenon and then allow them significant time to process while filling out their Notice, Wonder, Learn Journals (one copy recommended for EACH experiment). This would then be followed by a discussion where students share, either in small groups or as a class, the things

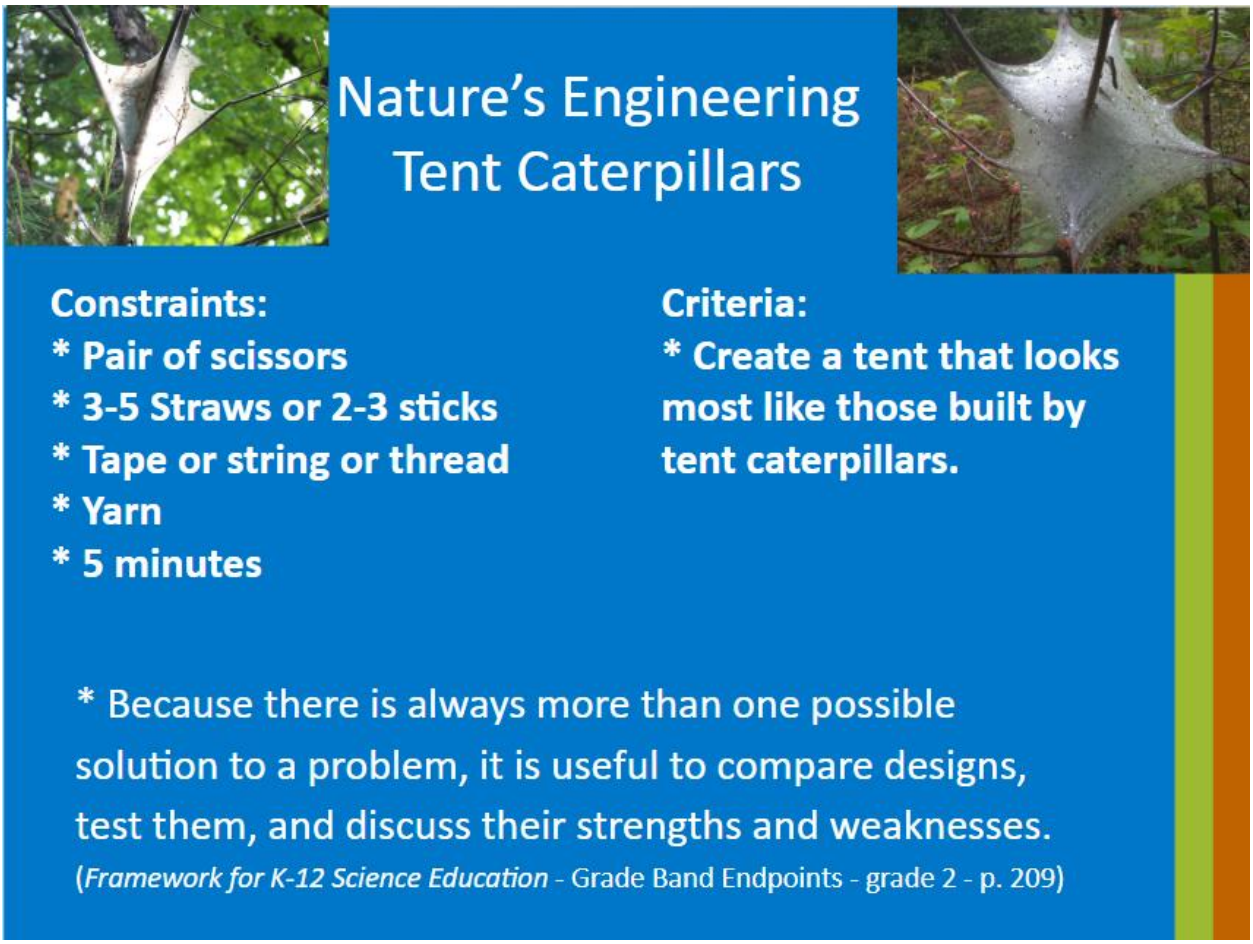
they noticed and wondered. Finally, once students have shared and investigated their questions, you can show them the explanation segment.

Resource 1: USDA
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5303047.pdf

Resource 2: Arizona Daily Star
https://tucson.com/news/science/environment/caterpillars-pitch-tents-in-sci-fi-like-numbers/article_36e31694-c403-51f9-8c8e-a6201974b6da.html

Resource 3: Video University of Florida (Eastern Tent Caterpillar *similar species*)
https://bit.ly/EasternTentCaterpillarVideo
(Learn about tent caterpillars in this video and a fancy word for poop!)

Engineering Extension
Using the IDEAS Engineering Journal (https://stemazing.org/ideas-engineering-journal/), you can engage students to engineer tents like those made by tent caterpillars.



#STEMAZingBrag – Share what your students have done on social media!
If you want to share your findings or share student work (no names or student faces), post them on TheSTEMAZingPro's Facebook and/or Twitter pages using the hashtag #SciencingAndEngineering in the posts.

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