Charlotte's Feast

2nd Grade
Unit 3 – Building Bridges with Unlikely Friends
Text Connection: *Charlotte's Web* by E.B. White

Design Challenge Summary
Challenge: What will the students be required to do?
Charlotte, like all spiders, must catch and trap her food to survive. Design a web at least 10 cubes wide to catch the most insects to feed Charlotte.
Standards: What standards are addressed?
Science: NS.1.2.1 Communicate observations orally, in writing and in graphic organizers NS.1.2.2 Develop questions that guide scientific inquiry NS.1.2.3 Conduct scientific investigations as individually and in teams NS.1.2.4 Estimate and measure length NS.1.2.5 Collect measurable empirical evidence in teams and as individuals NS.1.2.6 Make predictions in teams and as individuals based upon empirical evidence NS.1.2.7 Use age-appropriate equipment and tools in scientific investigations PS.6.2.1 Investigate the relationship between force and motion 2-PS1-2 Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. 2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strength and weaknesses of how each performs. **Math:** Mathematical Practice Standards 2.MD.1 Measure the length of an object by selecting and using appropriate tools 2.MD.10 Draw a picture graph/bar graph to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in the graphs. **Other:** W.2.2 Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points and provide a concluding statement or section W.2.3 Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts and feelings, use temporal words to signal event order, and provide a sense of closure W.2.7 Participate in shared research and writing projects SL.2.1 Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups SL.2.3 Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information or deepen understanding of a topic or issue SL.2.4 Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences SL.2.6 Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification

Result: What will students know, value, and be able to do as a result of the lesson? What's the big idea?

Know and apply the engineering design loop process.
Demonstrate ability to modify designs based on observations and predictions.
Work collaboratively on solving a problem.

Assessment: What evidence will be used to determine student learning?

Did they make a web that caught insects?
Did they follow the design loop process?
Did they work collaboratively?
Did they make improvements after initial testing?

Prior Knowledge/Experiences: What prior content knowledge and skills will the students need?

Experience with the Engineering Design Loop process
Connections to the Mathematical Practices
Investigations/inquiry in Science
Experiences with measurement in non-standard units

Summary/Connections: How will this design challenge connect with new/future learning, other content areas, real world experiences, etc.?

This lesson will help students develop problem solving skills and collaboration skills that are essential in succeeding in the 21st century. It will allow student the opportunity to transfer and apply skills from various content areas within one task.

As a summary activity, you could engage students in:
W.2.2 Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points and provide a concluding statement or section
W.2.3 Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts and feelings, use temporal words to signal event order, and provide a sense of closure

Collect data on which objects were trapped and which were not. (student recording sheets) Record these results in a class data chart. Analyze and interpret the data.

Extensions:
Research different types of spider webs.
Change web size or materials to see the effectiveness of catching insects
Test items thrown at different distances and record/analyze this data.

Materials/Equipment/Preparation: What materials and equipment will students need to successfully complete this design challenge?

Materials: 2 pencils and mound of Play-Doh
Unifix cubes
Yarn, Floss, String
Glue stick
2 inches of Duct Tape
Cotton Ball, Cube, Straw, Eraser (Insects)

- Make sure students are an equal distance from web before throwing insects into their webs

Name_____

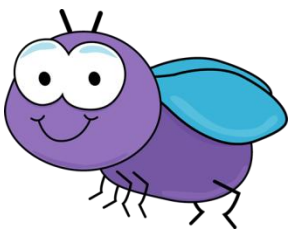
Directions: Create a web that catches the most insects.

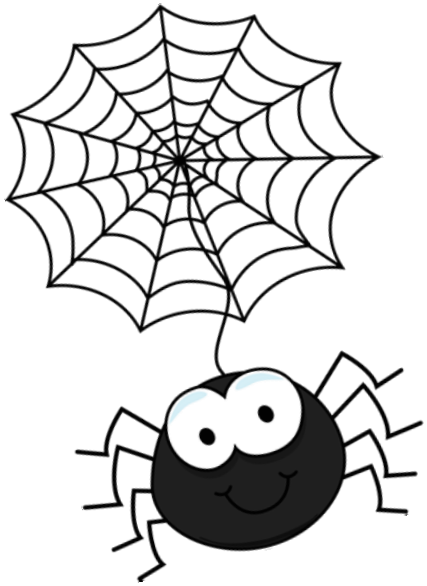
Insects	Trial # 1	Trial # 2
Cotton Ball		
Cube		
Straw		
Eraser		

Explain why your web caught some insects and not the others.

What did you change to your web to catch more insects? Did it work? How do you know?

Did how hard you throw the insect affect if it was caught? Why?





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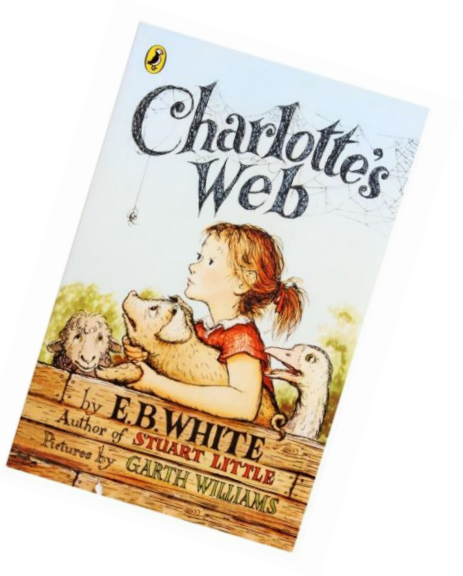

Charlotte, like all spiders, must catch and trap her food to survive. Design a web at least 10 cubes wide to catch the most insects to feed Charlotte.

Group Supplies:

2 pencils and mound of Play-Doh

Unifix cubes

Yarn, Floss, String

Glue stick

2 inches of Duct Tape

Cotton Ball, Cube, Straw, Eraser (Insects)