



*Student Page

Build A Hand Crank Winch



-Challenge:

Build A Hand Crank Winch using everyday objects.

-MATERIALS:

- Cardboard Tubes
- Spool
- Straw or Pencil
- String
- Tape
- Scissors
- Small Basket {object to attach to string}

-PROCEDURE:

1. Tape 2 cardboard tubes to a solid surface. Use your straw as a reference tool for how far apart they should be placed from each other.
2. Make 2 cuts at the top of each cardboard tube just big enough for the straw or pencil to rest and be able to spin.
3. Put your spool on the straw or pencil. Now if you don't have a spool, you can simply secure your rope to the straw or pencil with a piece of tape. You still have a hand crank winch! If you do use a spool make sure to secure it with tape to the straw or pencil. What if you don't secure it? The spool just spins around the straw and there is no ending up of string! If you are using a straw, you can even thread another straw into it and use the bendy part to make a handle!
4. Secure your rope or string to the spool with a piece of tape {or to straw directly if you don't have a spool} and tie your basket or object to the bottom of the string.

Example:





*Teacher Page

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We know that during play, children naturally engage in STEM (science, technology, engineering, and math) investigation. We also understand how crucial it is for adults to become SiW-literate in order to promote their children's SiEM literacy. Families are welcome to explore STEM topics via play by completing our STEM Challenges, which will benefit both adults and children. There are no "correct" answers in these open-ended challenges since adults and children collaborate to solve difficulties.

How to Support Learning during the STEM Challenge:

-Let Children Lead:

Adults are encouraged to allow the child to take the lead in the process. The design should be based on the ideas of the youngster. Adults can be helpful by holding materials as the child cuts or tapes them together.

-Ask Open-Ended Questions:

Asking open-ended questions can help adults enhance children's learning. Open-ended inquiries necessitate more than a yes/no response and allow youngsters to express their feelings and goals. Some examples of possible questions are...

- How did you...?
- Why did you...?
- What do you think would happen if....?
- What do you wonder about?
- What does this remind you of?
- Is there another way you can use this....?

-Reverse Engineer:

Inquire about "reverse engineering" as a method of approaching the design process. Children decide how to use the materials they have to make the ultimate result, keeping the end outcome in mind.

-Failure is Part of the Process:

Engineering is a process in which failures outnumber achievements. Allow children to understand that it's fine if their product fails the first, second, or hundredth time. The procedure is a loop in which you develop, test, tweak, and test again until you achieve your desired outcome. In the event that a design fails, consider the following:

- What else could you try?
- What do you think would happen if you changed this...?
- What did you notice... (about the design)?

