

Design Challenge: Making a Water Slide

Have your child kick off their summer vacation by making a miniature water slide! Using a few household supplies (plus any upcycled materials you wish), children combine their creativity and design thinking to imagine and then construct a model of a water slide. These instructions help guide children through the process, from conceptualization to construction, testing, and revision.



What You Need:

- Paper cups
- Paper tubes (such as paper towel rolls)
- Paper straws
- Plastic wrap
- Tupperware or container to make a “pool” at the bottom of the slide
- Glue
- Tape
- Small toy(s)
- Pen and paper for notetaking
- Any other supplies you find that can be upcycled!

What You Do:

Since this activity is fairly open-ended, there are numerous possibilities for how your child may decide to complete it. The purpose of this challenge is to allow your child to creatively decide how to use materials for a specific purpose: making a water slide. Although this is a creative challenge, it will likely be useful for you to guide your child through the process and provide suggestions for how they can best use their materials. We have given some ideas for how you can build your water slide, but feel free to make any adjustments according to the materials you have and what your child would like to do!

Part 1: Constructing the Water Slide

1. First, ask your child to **define** a slide by drawing some examples on a piece of paper. This will get your child to start thinking about the structure of a slide, prior to planning how they want to build their own.
 - a. Here are some questions you may ask your child to get them to start thinking about the design process: What do you notice about the structure of a slide? Do you notice how one end of the slide is always higher than the other? What is the difference between a normal slide and a water slide?
2. After your child has identified some of the key aspects of slides, allow them to **brainstorm** different ways they can use the materials you have provided them to create their own water slide. Ask them to write or draw their ideas on a piece of paper.
 - a. We suggest allowing your child to think creatively prior to making any suggestions, but feel free to guide them if you notice that they are stuck.
3. Once your child has made a plan for their water slide, allow them to begin **building**. Be sure to supervise and assist them at any time they need help.

Below, we have written a procedure for building a water slide. Feel free to use it if you'd like, or feel free to go solely off of your child's ideas:

1. Cut your paper tubes down on one side and stretch out the sides to create a slide structure. Depending on how long you want your slide to be, you may want to glue or tape two to three tubes together.
2. Add glue down the center of the tubes and cover them with plastic wrap.
 - a. Ask your child why they think it's necessary to use plastic wrap. (Answer: Plastic wrap makes the slide water-resistant.)

Part 2: Making a Structure to Support the Slide

1. After your child has built their water slide, explain that they will now need to create a structure that will hold up their slide.
2. First, ask your child to identify some of the necessary components of the water slide's supporting structure. Some questions you may ask to guide your child include:
 - a. What does the structure need to support? (Answer: The structure needs to hold the weight of the slide and the toys that go on it.)
 - b. Where does the structure need to go? (Answer: The structure must bring the slide down to the pool.)
 - c. What must the elevation of the structure be like? (Answer: The structure must start taller at the top of the slide, and gradually decrease in height to come down to the pool.)
3. After your child has thought critically about the key components of the slide's structure, they can begin **brainstorming** how they will make one. Again, ask them to write or draw their ideas on a piece of paper.

- a. Allow your child sufficient time to think independently and creatively about how they want to use the materials, but feel free to guide them with open-ended questions or suggestions whenever they are stuck.
4. Here is an idea for creating the structure that you may suggest to your child:
 - a. Poke two holes in the bottom of each of your paper cups. (The number of paper cups you will need depends on how long your slide is. Make sure to have enough to support the slide's weight.)
 - b. Then, tape one straw in each hole. This will create a Y shape in each cup, which will support the sides of the slide.
 - c. For the top of the slide, which is the tallest point, stack two cups together by gluing or taping their mouths together. This will add height to the structure. Only tape two straws in the holes of the top cup, which will then support the top of the slide.
5. Once your child has made a plan for how they want to build their supporting structure, allow them to start **building**. Be sure to supervise and help out wherever needed.

Part 3: Putting It All Together and Testing

1. Once your child has built both the water slide and its supporting structure, it's time for the fun part: putting it all together and testing it out! Make sure to test out your child's slide outside or in an area that you don't mind getting wet.
2. Have your child tape the water slide to the supporting structure, and place a container at the bottom of the slide to serve as a "pool."
3. In order to **test** their prototype, ask your child to bring a small toy and place it at the top of the slide. Then, have them pour water at the top of the slide and see whether their toy will successfully slide down to the pool.
 - a. Allow your child to experiment with different amounts of water and different speeds of pouring until they find what works best.
 - b. If your child finds any flaws in their design, help them figure out what went wrong and encourage them to make revisions. It is important that they keep brainstorming and prototyping until they make a successful structure.