

# Wind Turbine Blade Design Challenge

*KidWind Challenge:  
classroom version*



# Design Brief

- Background
  - Wind turbines harness the clean, renewable energy in the wind to generate electricity. Wind turbines can range in size to work in different wind speeds and to generate different amounts of energy. Turbines have three main parts – a tower, a nacelle containing the generator and sometimes a gearbox, and the rotor which is made up of the blades attached to a hub.
- Challenge
  - Design and build wind turbine blades to generate the most electricity using a given model turbine
- Criteria
  - Must operate safely for 30 seconds under fan's high speed
  - Must use the given generator and turbine base
- Materials
  - 12 hole crimping hub (KidWind)
  - Dowels to attach blades to hub
  - Anything you can think of – cardboard, wood, recycled containers, popsicle sticks, etc
- Tools
  - Glue, tape, scissors, box cutters, etc.
  - Multimeter or voltmeter to measure output

# Technology Design Loop

## 1. What is the problem?

## 2. Brainstorm solutions.

- Use your productive thinking talent to list many, varied, and unusual ideas.

## 3. Create the solution you think is best.

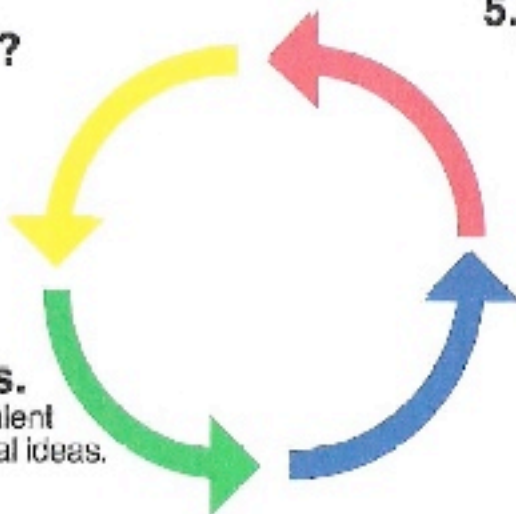
Make sure that you have a plan for how you will create your solution.

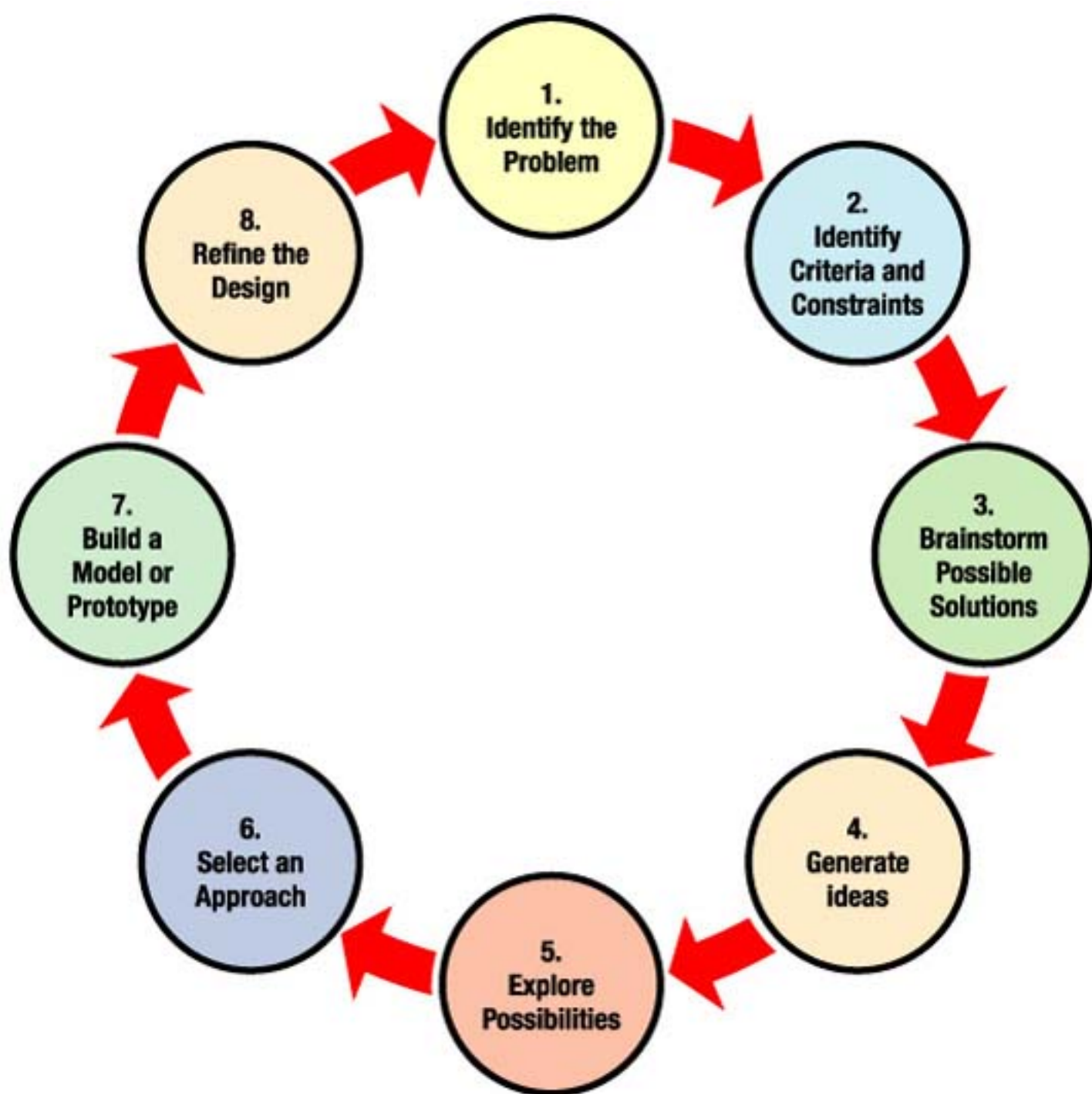
- What things will you need to create your solution?
- How will you build it? A sketch might help.
- List the problems that might keep you from building your solution.

## 5. Evaluate your solution.

- Was it the best solution?
- What would you have done differently?
- Can you add to it to make it better?

## 4. Test your solution.





# Procedure

- Restate the problem in your own words
- Brainstorm solutions (drawings encouraged)
- Create the solution you think is best
- Make an accurate drawing of your completed turbine labeling all the parts and dimensions.
- Test your solution (**provide worksheet with table and leading questions**)
- Evaluate your solution
  - Why was it the best?
  - Would one of your other ideas have been better? Why or why not?
  - Describe one thing you could do to improve the next blades you build.