



Designing a “Better” Pinwheel

Purpose:

- To become competent in completing an engineering-based lesson.
- To become skilled at leading engineering based lessons.
- To increase ability to lead an activity from *The Power of the Wind*.

Time: 60 minutes

Materials:

- Scissors
- Straight pins, pencils with erasers, paper (various weights), pinwheel patterns, paper plates, aluminum pie plates, paper clips, coffee stirrers, popsicle sticks

Trainer Notes:

STEP 1: Context and Introduction

Now that you have constructed an initial pinwheel, watched the video, and talked about the engineering design process, I have one more challenge for you. In the business world, scientists and engineers are always trying to find ways to improve products and refine their work. Now you will have a chance to make your pinwheel even “better” than we did the first time. Your challenge is to design and construct a “better” pinwheel than your current one.

Someone may ask what “better” means. In this case, groups can decide HOW they want to make their pinwheel better. Possible ideas include: turn faster, turn for a longer period of time, bigger, smaller, etc. You may want to ask: What are ways you can think of to define better? What would make it better for your team?

Using the handout for the engineering design process, I want your groups to document what it is they are doing. Take each step and think as a group about how you want to proceed and what it is you want to be able to accomplish. Not unlike other things we have done, this is the intentional aspect of the engineering design process—what do you want to accomplish and how will you figure that out?





STEP 2: Activity

You will have 30 minutes to design and construct a “better” pinwheel. Materials are located _____ (*tell participants where materials are located*).

As participants are doing the activity, the facilitator should move around the room and check in with groups to identify progress and challenges they are having. This may be a time when the facilitator encourages the learning with open-ended questions about what is happening, what they have done, what they want to do. Remind people about the handout of the engineering design process. Ask them to make notes on each step of the process as they build a “better” pinwheel. The activity can take about 30 minutes.

STEP 3: Discussion

Now that you have each completed the activity, let’s share with the group. Remember, we are doing this as though we were “learners” so share as though you were a youth going through this activity. Each small group needs to describe their design and redesign to the large group.

Ask the following questions of each group after they share about their model:

- What element of the design did you choose to to make “better”?
- How did you go about doing it (what was the process)?
- What did you learn through doing this?

STEP 4: Review as Facilitators

It is now time to once again take off your “learner hats” and put on your “facilitator” or “group leader hats.” Let’s spend some time thinking about what you did and consider what it means to you as a leader working with youth.





Please turn to pages 16 – 17 in *The Power of the Wind Youth Guide*. The activity “How Can We Design a Better Pinwheel?” is essentially the same activity you completed. Let’s look closely at the lesson and see what additional ideas are included that might help you as a leader or a youth complete this activity.

Have participants look at the lesson in both Youth and Facilitator Guides. Have them share additional items that they had not thought about in their activity.

STEP 5: Video Discussion

You were also given content in a video to help you make your design better.

- How did the video (content information) help you either in the design or implementation phase?
- Other than video, how else can content be infused throughout this curriculum?
- How do you plan to infuse content into the lessons you lead with youth?

As you can see, content can be embedded into learning experiences, and specifically by using *The Power of the Wind* curriculum in a number of ways.

While some youth may search more or less for content, knowing how to help them find what they are looking for can help foster their learning, and continue their interest in this area. You are not expected to have all of this content knowledge, nor do you need to have it, to provide rich learning experiences for youth.





STEP 6: Review the Process

We had you document what you were doing at each step of the engineering design process so you could become familiar with the steps and think about what this meant to implementing *The Power of the Wind*.

- Why do you think we had you use that tool?
- In what ways did it help you become familiar with the steps in the process?
- What was it like to document what you were doing?
- How might this work with the youth you work with?
- How might you want to do this differently?

STEP 7: Transition

You will now take all of this experience and knowledge and plan with other team members to lead an activity yourself.

