Group Roles and Windmill Handout

*Speaker/Big ideas person*.

The speaker and the big idea person pulls the group (occasionally) back to the scientific purpose of the activity (often a group will get too wrapped up in the rote execution of the directions), as well as shares out during the presentation.

*Purchaser/Questioner*.

This person asks probing questions during the activity and goes to purchase needed supplies. These folks listen for questions posed by other group members and then re-voice the questions to make sure that the whole group takes a moment to hear and entertain questions from everyone.

*Recorder/Skeptic*.

This person tries to strengthen the group’s work by probing for weaknesses in the developing explanation or model, while also recording information about the design (e.g. mV, mil, and aesthetics).

*Accountant/Progress monitor*.

This person ask others to periodically take the measure of the group’s progress, and keeps track of money spent.

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| **Team Name:** | **Voltage (mV)** | **Amps (mI)** | **Money Used (mil)** | **Power Produced**  **(mV x mI) = Power (mW)** | **What variables are you going to change and why? (e.g. blade size, number of blades, blade angles, etc.)** |
| Design 1 |
|  | 1. | 1. | Items/Cost: | Avg. mV: |  |
| 2. | 2. | Avg. mI: |
| 3. | 3. | Power: |
| Design 2 | **mV** | **Amps (mI)** | **Money Used (mil)** | **Power** | **What variables are you going to change and why?** |
|  | 1. | 1. | Items/Cost: | Avg. mV: |  |
| 2. | 2. | Avg. I: |
| 3. | 3. | Power: |
| Design 3 | **mV** | **Amps (mI)** | **Money Used (mil)** | **Power** | **What variables are you going to change and why?** |
|  | 1. | 1. | Items/Cost: | Avg. mV: |  |
| 2. | 2. | Avg I: |
| 3. | 3. | Power: |

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| Where is the energy needed to spin the windmill coming from and what kind of energy is it converted into when it spins? How does that energy get converted to electrical energy? |
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| What claim can you make between the power output and the variables you changed? Cite evidence from you design process to support your claim. |
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| Calculate your team’s power to cost ratio by dividing power (milliwatts) by cost (mil) to get your power to cost ratio (milliwatts/mil) for each design. Which design had the highest power to cost ratio? Is that the design your team feels is the best? Why or why not? |
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| In order to make your team’s best performing design inviting to investors, how do you plan on aesthetically embellishing it so that communities will be willing to have a wind farm near their home? (Scored on a 1-5 scale; make your reasoning convincing!) |
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