When we approach situations or people with enthusiasm sometimes our energy levels are depleted. This happens when the energy we bring to the situation is blocked or rejected. Like liquid in a paper cup with small holes in it, our energy drains. Think about the relationship you have with others. • Do these relationships foster your energy or drain your energy? • What do you do to foster energy in those around you?

Devise a plan of action for when you are around someone who drains your energy. Need some ideas? Try some of the tips from Psychology Today to help you overcome negative energy. [https://www.psychologytoday.com/us/blog/the-ecstasy-surrender/201412/tips-sensitive-people-protect-their-energy](https://www.psychologytoday.com/us/blog/the-ecstasy-surrender/201412/tips-sensitive-people-protect-their-energy)
**LOGIC PUZZLE**

This “burning rope” problem is a classic logic puzzle.

You have two ropes that each take an hour to burn, but they burn at inconsistent rates. How can you measure 45 minutes?

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**FIELD STUDIES**

Ocean waves are powerful. Whether you have felt them at the beach, seen them in a movie, or read about them in a book, you are most likely familiar with the image of someone getting knocked over in the ocean. There are scientists who are studying how to harness the energy of ocean waves to create renewable energy. Explore both links to see two different methods that are under research:

- [https://www.youtube.com/watch?v=1LJpBnxzG30](https://www.youtube.com/watch?v=1LJpBnxzG30)
- [https://www.sciencenewsforstudents.org/article/ocean-energy-could-be-wave-future](https://www.sciencenewsforstudents.org/article/ocean-energy-could-be-wave-future)

Which of these two methods seems like the more viable option? Research to see if there are additional methods being explored. Have any of the methods been used yet to generate electricity? Record in your science notebook your thoughts about the barriers to making this a common energy source.

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**RESEARCH EXPLORATIONS**

You work for a design company that specializes in harnessing water energy. Your city wants to use hydroelectric power instead of coal as an energy source to limit air pollution. Your engineering team will design and test several water wheels for the firm to present the most efficient design for the city. You will calculate power and work by measuring force, distance, and time for your team-built waterwheel.

Watch the video for instructions to create a waterwheel and use the H2O solutions sheet to calculate power and work: [https://www.teachengineering.org/activities/view/cub_energy_lessn02_activity1](https://www.teachengineering.org/activities/view/cub_energy_lessn02_activity1)

H2O Solutions Sheet: [https://www.teachengineering.org/content/cub_energy/cub_energy_lessn02_activity1_waterwheelworksheet.pdf](https://www.teachengineering.org/content/cub_energy/cub_energy_lessn02_activity1_waterwheelworksheet.pdf)

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**MATH**

The Juno spacecraft became the most distant solar-powered spacecraft in 2016. To gather enough power during its journey Juno has three, 30-foot arms covered in solar cells. Scientists use the inverse square law to determine the solar power required for a journey. Visible light follows the inverse square law, which is represented as $1/r^2$. Jupiter is 5 times farther away from the Sun than Earth, so using the inverse square law, $1/(5^2)$, Jupiter has only 1/25 as much available light as Earth.

Set up a demonstration (see link below) of how the inverse square law helps determine the required solar power for space trips. Did your finding fit the inverse square law? Explain. Why is it important for scientists to understand this relationship on space missions? [https://www.jpl.nasa.gov/edu/teach/activity/collecting-light-inverse-square-law-demo/](https://www.jpl.nasa.gov/edu/teach/activity/collecting-light-inverse-square-law-demo/)
6-7 Logic Puzzle:
Solution: Light both ends of rope A and one end of rope B. After 30 minutes, rope A will be completely burned up and there will be 30 minutes of rope B left. Light the other end of rope B; it will burn up in 15 minutes. Total time elapsed since starting the ropes on fire: 45 minutes.

8-9 Logic Puzzle:
Solution: Number the switches 1, 2 and 3. Switch on number 1 for 1 minute, then switch it off. Switch on number 2. Go upstairs and examine the lights. The light that is on is connected to switch 2. The light that is off and warm is connected to switch 1. The light that is off and cold is connected to switch 3!!

8-9 Field Studies:
If you are interested in learning more about how nuclear energy works, visit:
https://www.nationalgeographic.org/video/what-nuclear-energy

10-12 Logic Puzzle:
Solution: 28
Each day he makes it up another meter, and then on the twenty-seventh day he can leap three meters and climb out.
## Energy
### NC Standards Alignment

<table>
<thead>
<tr>
<th>Grade Span</th>
<th>English/Language Arts</th>
<th>Social Studies</th>
<th>Science</th>
<th>Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-1</td>
<td>RL.1.2</td>
<td>1.G.2.1 1.G.2.2 1.G.2  K.H.1</td>
<td>1.L.2</td>
<td>NC.1.MD.4</td>
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<td>W.9-10.1</td>
<td>8.G.1.3 8.G.1</td>
<td>EEn.1.1.3 EEn.1.1.4</td>
<td>NC.M1.A-CED.4</td>
</tr>
<tr>
<td>10-12</td>
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<td>AH2.H.2</td>
<td>EEn.2.2</td>
<td>NC.M1.A-CED.1</td>
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