Lesson 6: Running in Circles: How Fast Can We Go?

**Overview**

This lesson explores individual choices and work styles and how some of those choices may lead to cycles of burnout. Students take on the role of “advisor” to friends who are experiencing these cycles and also reflect on their own personal life choices.

Learning Goals:
- Represent and interpret data on a line graph.
- Explore possible causes of burnout and identify potential leverage for prevention.
- Give advice to “friends” based on an understanding of causes and leverage points.
- Self-assess, reflect, and make a personal plan.

**Materials:**
- One computer for every 2-3 students
- Simulation online at http://www.clexchange.org/curriculum/complexsystems/oscillation/Oscillation_BurnoutB.asp
- Handouts (see pages 5-22)

**Curricular Connections:**
- Math: Representing and interpreting data*
- Reading: Describing connections between ideas*
- Science: Feedback mechanisms, motivation of organisms
- Social Studies: Individual development and identity
* Common Core Standards

**Key system dynamics concepts and insights:**
- Energy and participation levels affect one another and can create cycles of burnout over time.
- Both energy recovery and energy drain are affected by activity.
- Leverage for preventing burnout includes limiting hours of activity.

**Student Challenge**

Explore a series of situations, giving advice to virtual “friends” who are experiencing burnout cycles.
Lesson Details

Preparation:
1. Create groups of two to three students each.
2. Copy all handouts for each student or student group.
3. Check computers to make sure you can access the online simulation.

Session 1:
1. Introduce vocabulary as needed including cycle, burnout, and types of participation in activities (e.g., going to school, studying, working a part-time job, being in a club, and taking care of a younger sibling).
2. Describe the project in which students will put together final recommendations for the case studies and also for themselves. Go over the requirements and rubric (Handout 1 on page 5).
3. Have students open the simulation and read the introduction (Handout 1 and Figure 2).
4. Students can now set up the simulation on the “Decisions” screens (Figure 3). As they do this, have students record data and reflections as they work through the experimental stage and case studies in the handouts (Handout 2 on pages 7-17 and Figure 4).

Session 2:
1. If needed, have students complete the simulation within their small groups.
2. After working through the case studies and personal reflection, students can continue to the “Debrief” section (Handout 3 on pages 18-19 and Figure 5).
3. Debrief the simulation experience using ideas for bringing the lesson home and
Lesson Details

assessment ideas. The key assessment in this lesson is a write-up of final recommendations that summarize the student's learning (Handout 4 on pages 20-21).

4. A second, optional assessment allows students to show their understanding of the interconnections among the main simulation elements (Handout 5 on page 22). See below for one possible “story” of the loop.

Example Story: Participation level represents how much a person is doing. Energy level represents how good people feel physically. Are they feeling really energetic or are they tired? These affect one another.

If participation goes up, energy drains out. If energy goes down, participation goes down, too. People are too tired to do much, so they stop.

Once they decrease how much they are doing, they can recover some energy. If energy is higher, people can again do more, so participation goes up.

Bringing the Lesson Home:

• Have students explore the “Debrief” and “Next Steps” sections of the simulation within their small group or as a class (Handout 3 on pages 18-19). Note that some of the resources on the “Next Steps” section are YouTube videos.

• Discuss the trends on the graphs and the interconnections among the parts.
  • What caused the burnout oscillations?
  • How do the various elements increase or decrease the likelihood of burnout occurring?
  • What are the key leverage points for preventing burnout?
  • How do these ideas connect to what people expect of one another?

Assessment Ideas:

• Create a write-up of final recommendations for “friends” and also for self. (Handout 4 on pages 20-21).
• Describe the interactions among the main simulation elements (Handout 5 on page 22).
Running in Circles: How Fast Can We Go? – Introduction

Some of your friends have asked you for advice. You will use this simulation to help them think about choices they make in their lives and how those choices may affect what they are able to do and their energy levels. At the end, you’ll write your final recommendations.

Parts of the project:
1. Title page
   - Title: Running in Circles: How Fast Can We Go?
   - Name and date
   - An illustration of life choices related to school, work, and play
     You can create a collage, drawing, or other representation to show the parts of the system and how they are connected.

2. Handouts 1-3, complete and organized neatly in order
   - Handout 1 – Instructions, rubric, and introduction
   - Handout 2 – Experimental runs and case studies
   - Handout 3 – Debrief

3. Handout 4 – Final recommendations for each student and your personal plan

4. Handout 5 – Assessment

Project Assessment Rubric

<table>
<thead>
<tr>
<th></th>
<th>Novice</th>
<th>Basic</th>
<th>Proficient</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title Page</strong></td>
<td>My pictures are not about the system.</td>
<td>I have pictures, but I didn’t show any connections.</td>
<td>My pictures show important parts of the system and how they are connected.</td>
<td>In addition, I added words to explain the connections.</td>
</tr>
<tr>
<td><strong>Handouts</strong></td>
<td>I didn’t explain what happened.</td>
<td>I recorded results that were mostly accurate. I explained what happened.</td>
<td>I recorded results that were accurate. I clearly explained what happened and why.</td>
<td>In addition, I met each challenge and explained why I was successful.</td>
</tr>
<tr>
<td><strong>Recommendations (RECs)</strong></td>
<td>My RECs are missing or very little is included to show my learning.</td>
<td>I wrote RECs, but I did not include proof from the simulation.</td>
<td>I wrote clear RECs and included proof from the simulation.</td>
<td>In addition, I gave real-life examples of the RECs.</td>
</tr>
</tbody>
</table>
Click the picture of the burning match. What is the definition of burnout in your own words?

Click the Start button. Read the “Introduction” screen and click on the pictures.

What is the definition of an activity in this simulation?

What is an example of an activity?

What is an activity that’s not included in this definition?

Click “Decisions.” Click the question marks (?) and pictures for each of the decisions. After reading each one, write a definition in your own words and give an example.

Participation limit

Example:

Time to adjust

Example:

Exercise

Example:

Sleep

Example:

Drive

Example:
Running in Circles: How Fast Can We Go? – Exploration

Experimental Runs:
Do several runs with different settings. Just experiment and see what you can discover about what happens with different settings. When you feel you know enough to give your friends some advice, write a summary of your learning below and proceed to your first “case.” Make sure to include what causes the ups and downs of burnout in the simulation.

What I’ve learned so far:

________________________________________

________________________________________

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________________________________________

Case Studies:
Friend #1 – Raven
Friend #2 – Sammy
Friend #3 – Evelyn
Friend #4 – Oxford
My Pattern
Friend #1 – Raven:
Raven is an extremely ambitious student. She will be the first person in her family to attend college, and both she and everyone around her have very high expectations. Because of her drive to do more and more no matter what, she has been having some problems with keeping promises over the last year. Her family is very worried, because she's always stayed on top of responsibilities in the past.

Set the simulation as shown below and then run.

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation limit</td>
<td>90 hours/week</td>
</tr>
<tr>
<td>Time to adjust</td>
<td>1 week</td>
</tr>
<tr>
<td>Exercise</td>
<td>2 hours/week</td>
</tr>
<tr>
<td>Sleep</td>
<td>35 hours/week</td>
</tr>
<tr>
<td>Drive</td>
<td>0.2 (very high)</td>
</tr>
</tbody>
</table>

Record your results on the graphs below. Make sure to create labels and a key for each graph. Note that you’ll need to click the bottom-left corner of the graph to see Page 2.
Friend #1 (continued):

a. Why do you think Raven is experiencing cycles of burnout?

b. Raven wants to stop the cycles, but she still wants to achieve a lot. What are some ideas that would help her stop the crazy ups and downs while still keeping accomplishments high?

Continue running the simulation, trying different plans for Raven. Record the graphs for your best run below.

Participation in activities and Energy level

Accomplishments per week and to date

c. What were the new settings?

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation limit</td>
<td></td>
</tr>
<tr>
<td>Time to adjust</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td></td>
</tr>
<tr>
<td>Drive</td>
<td></td>
</tr>
</tbody>
</table>

d. What changes would Raven really need to make in her life in order to accomplish this?
Friend #2 – Sammy:
Sammy has a high drive, but he also finds time to exercise and get plenty of sleep. His goal is to make the next Olympics team in gymnastics. Unfortunately, he still has periods of exhaustion. This causes him to lose interest in working so hard; he stops showing up for practice and is also having trouble keeping up in school.

Set the simulation as shown below and then run.

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation limit</td>
<td>100 hours/week</td>
</tr>
<tr>
<td>Time to adjust</td>
<td>1 week</td>
</tr>
<tr>
<td>Exercise</td>
<td>10 hours/week</td>
</tr>
<tr>
<td>Sleep</td>
<td>60 hours/week</td>
</tr>
<tr>
<td>Drive</td>
<td>0.2 (very high)</td>
</tr>
</tbody>
</table>

Record your results on the graphs below. Make sure to create labels and a key for each graph. Note that you’ll need to click the bottom-left corner of the graph to see Page 2.
Friend #2 (continued):
a. Why do you think Sammy is experiencing cycles of burnout?

b. Sammy wants to stop the cycles, but he still wants to make the team. What are some ideas that would help him stop the crazy ups and downs, while still keeping his chances high for making the Olympic team?

Continue running the simulation, trying different plans for Sammy. Record the graphs for your best run below.

c. What were the new settings?

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation limit</td>
<td></td>
</tr>
<tr>
<td>Time to adjust</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td></td>
</tr>
<tr>
<td>Drive</td>
<td></td>
</tr>
</tbody>
</table>

d. What changes would Sammy really need to make in his life in order to accomplish this?
Friend #3 – Evelyn:
Evelyn has some drive, and she has a hard time saying no to other people's requests. Because of this, her participation limit is high. She also doesn't find the time to exercise because she is always doing tasks for other people.

Set the simulation as shown below and then run.

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation limit</td>
<td>80 hours/week</td>
</tr>
<tr>
<td>Time to adjust</td>
<td>1 week</td>
</tr>
<tr>
<td>Exercise</td>
<td>0 hours/week</td>
</tr>
<tr>
<td>Sleep</td>
<td>40 hours/week</td>
</tr>
<tr>
<td>Drive</td>
<td>0.1 (some)</td>
</tr>
</tbody>
</table>

Record your results on the graphs below. Make sure to create labels and a key for each graph. Note that you'll need to click the bottom-left corner of the graph to see Page 2.
Friend #3 (continued):

a. Why do you think Evelyn is experiencing cycles of burnout?

b. Evelyn wants to stop the cycles, but she still wants to achieve a lot. What are some ideas that would help her stop the crazy ups and downs while still letting her help others from time to time?

Continue running the simulation, trying different plans for Evelyn. Record the graphs for your best run below.

Participation in activities and Energy level

Accomplishments per week and to date

c. What were the new settings?

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td></td>
</tr>
<tr>
<td>limit</td>
<td></td>
</tr>
<tr>
<td>Time to adjust</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td></td>
</tr>
<tr>
<td>Drive</td>
<td></td>
</tr>
</tbody>
</table>

d. What changes would Evelyn really need to make in her life in order to accomplish this?
Friend #4 – Oxford:
Oxford has no drive at the moment. He wants to do more than he's currently doing but could use some advice. He does not want to turn his life into “Work, Work, Work!” He's seen what has happened to some of his friends; it seems to him they have no life.

Set the simulation as shown below and then run.

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation limit</td>
<td>40 hours/week</td>
</tr>
<tr>
<td>Time to adjust</td>
<td>1 week</td>
</tr>
<tr>
<td>Exercise</td>
<td>5 hours/week</td>
</tr>
<tr>
<td>Sleep</td>
<td>70 hours/week</td>
</tr>
<tr>
<td>Drive</td>
<td>0 (none)</td>
</tr>
</tbody>
</table>

Record your results on the graphs below. Make sure to create labels and a key for each graph. Note that you'll need to click the bottom-left corner of the graph to see Page 2.
Friend #4 (continued):

a. Why do you think Oxford is not experiencing cycles of burnout?

b. Oxford wants to increase his accomplishments, but not by exhausting himself. What are some ideas that would help him increase success, while still preventing burnout cycles?

Continue running the simulation, trying different plans for Oxford. Record the graphs for your best run below.

c. What were the new settings?

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation limit</td>
<td></td>
</tr>
<tr>
<td>Time to adjust</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td></td>
</tr>
<tr>
<td>Drive</td>
<td></td>
</tr>
</tbody>
</table>

d. What changes would Oxford really need to make in his life in order to accomplish this?
My Pattern:
What's your story?

Set the simulation based on your story and record the settings.

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation limit</td>
<td>hours/week</td>
</tr>
<tr>
<td>Time to adjust</td>
<td>week</td>
</tr>
<tr>
<td>Exercise</td>
<td>hours/week</td>
</tr>
<tr>
<td>Sleep</td>
<td>hours/week</td>
</tr>
<tr>
<td>Drive</td>
<td></td>
</tr>
</tbody>
</table>

Record your results on the graphs below. Make sure to create labels and a key for each graph. Note that you’ll need to click the bottom-left corner of the graph to see Page 2.

Participation in activities and Energy level

Accomplishments per week and to date
My Pattern (continued):
a. What's happening on your graphs? Are cycles of burnout happening?

b. How accurate are the graphs in comparison to what's really happening in your life?

c. What, if any, changes would you like to see? If none, please explain why. Try some different ideas using the simulation, and then record your favorite run below.

d. What were the new settings?

<table>
<thead>
<tr>
<th>Slider</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>limit</td>
</tr>
<tr>
<td>Time to adjust</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td></td>
</tr>
<tr>
<td>Drive</td>
<td></td>
</tr>
</tbody>
</table>

e. What changes would you really need to make in your life in order to accomplish this?
Debrief - Part I

Go back to the Menu and click “Debrief.” Explore each of the four sections, answering the questions below.

Click “1. Burnout Ups & Downs.”
Look at each of the example situations. Make sure to read each of the stories and look at the graphs for accomplishments.

a. Which situation allowed the person to accomplish the most? Why?

b. Which situation do you think is best for keeping people happy and healthy? Why?

c. Which situation is closest to your own pattern? In what ways?

Click “2. Burnout as a Circle.”
Read the story of the loop.

a) Why does the loop create ups and downs over time?

b. What’s one example of this loop in your own life experience?
Debrief - Part II

Click “3. Burnout Map.”
Read and click “Next Part.” Click the map and unfold the story.

How did the five parts you changed affect desired accomplishments, participation level and energy level?

Participation limit:

Time to adjust:________________________ __________________________

________________________ __________________________

________________________ __________________________

________________________ __________________________

Exercise :

________________________ __________________________

________________________ __________________________

________________________ __________________________

________________________ __________________________

Drive:________________________

Sleep: __________________________

Click “4. Connections.”
What are some other connections you can see between burnout cycles and other systems in the world?
## Final Recommendations

<table>
<thead>
<tr>
<th>Student</th>
<th>What I think is the best plan</th>
<th>Why this plan is best for this person (Include proof and examples.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student #1 –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student #2 –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sammy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student #3 –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evelyn</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Final Recommendations (continued)**

<table>
<thead>
<tr>
<th>Student</th>
<th>What I think is the best plan</th>
<th>Why this plan is best for this person (Include proof and examples.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student #4 – Oxford</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Me</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Assessment:

Describe the story of the loop. Make sure to write about each part and how it affects the other part.

What could you add to this loop to make the story even better? Draw ideas on the back and explain below.
Acknowledgements:
Lesson 6 – Level B
Running in Circles: How Fast Can We Go?
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This model is one in a series of models that explore the characteristics of complex systems.

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Jen Andersen
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Rock climber, Geof Sheppard, Wikimedia Commons, Creative Commons Attribution-Share-Alike 3.0 Unported license.
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Kids on computers, IICD.org, Wikimedia Commons, Creative Commons Attribution 2.0 Generic.
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Students in lab, Dennis Kwaria, Wikimedia Commons, Creative Commons 1.0 Universal Public Domain Dedication.
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Students on bench, Dennis Kwaria, Wikimedia Commons, Creative Commons Attribution-Share Alike 3.0 Unported.
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Two kids on game system, by Arpingstone, Wikimedia Commons, Public Domain.
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