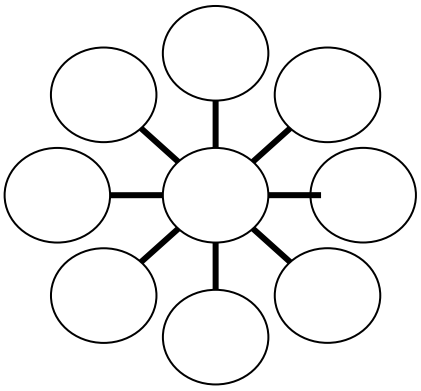
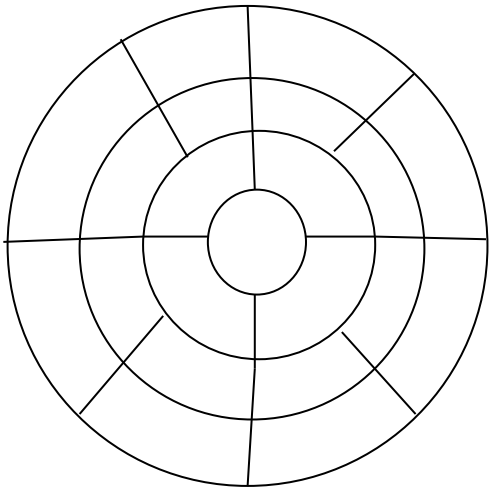
Teacher Sheet 1

PROBLEM SOLVING ACTIVITY: GLOBAL WARMING EFFECTS

The issue of global warming has been transformed from one of concern for a small group of scientists to an item on the agenda board of world leaders. As an aid to thinking about the many interconnections of this topic the technique of a "future wheel" can be used. One of the initiators of this technique back in the 1990s was the **Acid Rain Foundation** which used it to brainstorm and evaluate the effects of that problem.

The technique involves starting with a "What if……?" and responding with as many consequences as possible. These are arranged around the original "What if….?" and connected to it through consecutive circles radiating out from the center. The primary consequences themselves have secondary consequences in the next circle out, etc. The size of the wheel (the number of connecting circles) can be changed depending upon the ability level of the group. An option is to use a concept web format where individual consequences can be arranged around a center circle and radiate out like the spokes of a wheel. (See some possible formats below.)





OBJECTIVES: Students will:

- ✓ Research the causes and effects of climate change;
- ✓ Understand the concept of a "chain reaction" regarding environmental events;
- ✓ Evaluate environmental events and how they might influence life on Earth;
- ✓ Communicate their ideas through a climate change poster;

Teacher Sheet 2

MATERIALS: Butcher paper, red, green and black markers, "Post-its," copies of blank effects wheel, paper, pencil, articles or list of consequences, template of effects wheel,

PROCEDURE:

1. Organize students in groups of 3-4.

2. Ask the students to take a few minutes to write down five things that they know or have read/heard about climate change. Have them consider the following questions:

   - What is climate?
   - What is global warming?
   - What is the greenhouse effect? And what are greenhouse gases?
   - Why do you think that climate change and global warming is in the news so much today?
   - What are some potential national, regional, and local issues?
   - What are some social and cultural implications of climate change?
   - What is 'wrong' with the current trend in global warming?
   - Why is climate change an issue for us today when climate has changed in the past, and can be expected to change now and in the future?

3. Pass out some informational reading selections or lists of environmental consequences of climate change.

   - Give students several minutes to read through the articles or the list.
   - Students should highlight events/effects that they came across in their reading.

4. Ask the students for any ideas highlighted in the articles.

Teacher Sheet 3

- On a sheet of butcher or chart paper create two columns, one for positive effects and one for negative effects.

- Events that are considered beneficial should be place in the **Positive** column.
- Events that are considered detrimental should be placed in the **Negative** column.
- If students feel that an event could be either positive or negative create a third column for those events.

5. Explain the concept of an **EFFECTS WHEEL** as a versatile tool used to study cause and effects implications and relationships in any situation.

   - It reveals the many effects on interrelationships of a single decision or situation.
   - It can be used to highlight these interactions and more clearly understand the relationships among them.

6. Have each group choose their own statement on climate change and begin to explore the results using their **EFFECTS WHEEL**. Example scenarios might be:

Temperature rises-- Ice caps melt--Sea level rises--Coastal flooding

7. Students should explore the impacts of their main statement by listing at least five first-level implications and project out at least three levels of implications.

   - Statements of events should be written on Post-Its.
   - If the event is considered to be **POSITIVE** it should be written or circled in **RED**.
   - If the event is considered to be **NEGATIVE** it should be written or circled in **BLACK**.
   - If students think the event could be either positive or negative they should write or circle it in **GREEN**.

8. Have each group work co-operatively to present and explain their **EFFECTS WHEEL**. They must be prepared to defend their decisions or judgments they have reached and to answer questions from peers.

LESSON EXTENSIONS

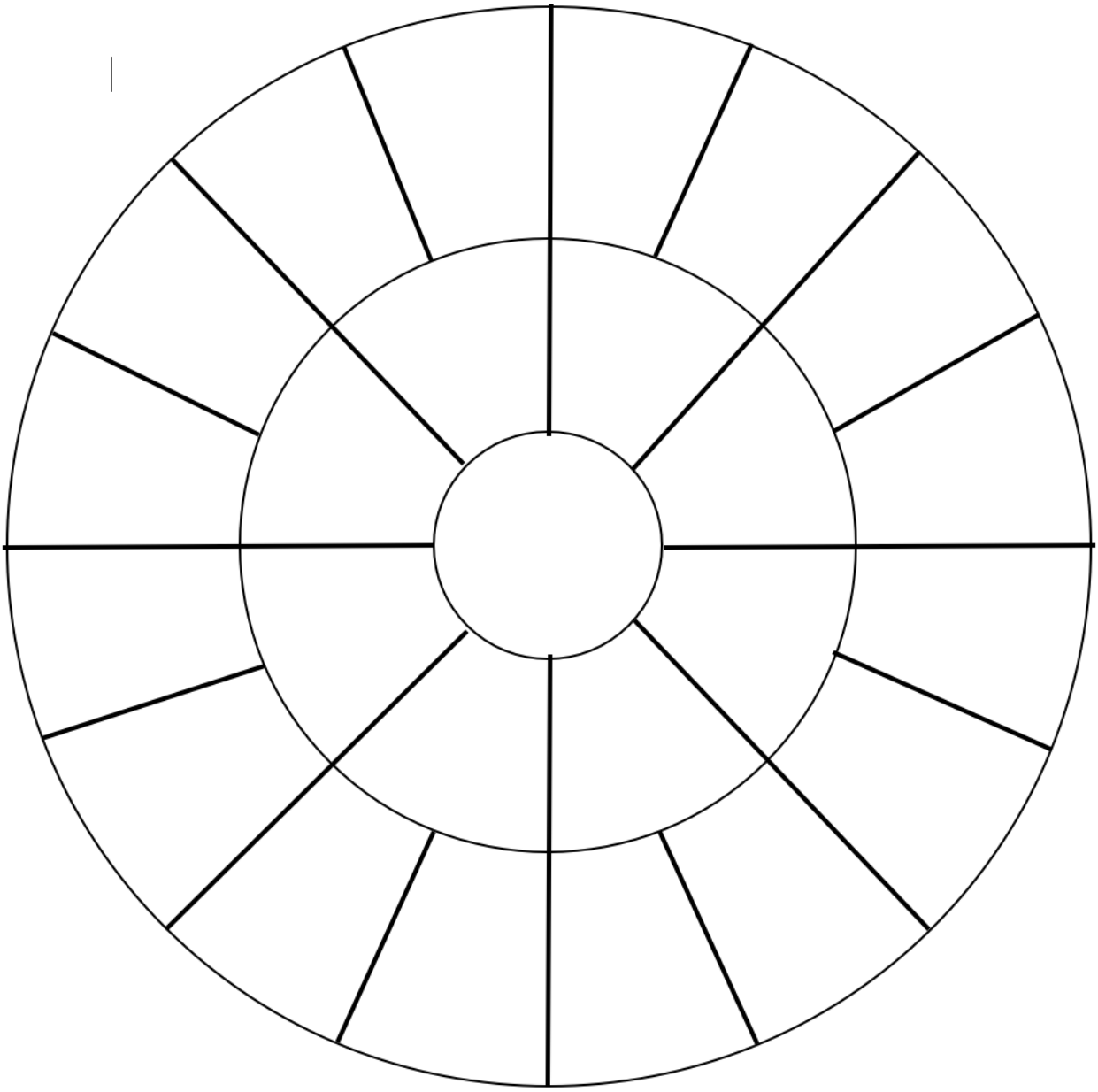
1. Challenge the class to create a climate change poster.

   - ✓ Each group will be responsible for the text and graphics describing their researched theme or category.
   - ✓ Using the results of the Futures Wheel and questions, have each group create the text and graphics for a separate panel and together create a class climate poster.

2. Have your class prepare a climate change information session for an audience. Students can present their findings from their research, as well as describe their projections for climate change on their **EFFECTS WHEELS**. The audiences may include other classes at the school; elementary students in local schools also studying climate change; community/parent information night; etc.

NOTE: The template on the following page can be made into a transparency for use with the entire class at one time OR as a pattern for students making a larger version on butcher paper using an overhead projector.

Effects Wheel Template



Connections Map Template