

## Grammar Focused Lesson Plan for Language Supported Sustainable Systems course, Parsons

**LEVEL:** Lower Advanced

**TIME:** 160 minutes

**OBJECTIVE/CONTEXT:** By engaging the topic of ‘wicked problems’ through reading, design examples, drawing and listening students will be exposed to and develop a verbal and visual vocabulary for expressing complex systems of change.

**KEY VOCABULARY:** Wicked Problems, Complexity, Interdependency, Entanglement, Contradiction

## Expressing causal chains of effect

1

<p><b>TOPIC + GRAMMAR PRESENTATION (STUDY)</b></p>	<p><b>PROJECT ON OVERHEAD:</b>  <b>TASK:</b> Talk with your partner and come up with three causes of climate change and at least two changes that each of those causes produce.</p> <p>*without knowing it, students are already making lists of AFFECTS (CAUSES) and EFFECTS (RESULTS)</p> <p><b>Wicked Problems:</b>  Traditional definition of “wicked” means evil, or bad. In the context of Wicked Problems (a collocation) the term ‘wicked’ is used, but not in the sense of evil but rather to express its resistance to resolution. <b>Visually, a wicked problem appears like a spider web instead of a liner line.</b></p> <p><b>PROJECT DEFINITION”</b>  <i>The phrase is used to describe a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. Many issues related to climate change can be understood as wicked problems.</i></p> <p>Because of complex <b>interdependencies</b> the effort to solve one aspect of a wicked problem may reveal or create other problems.</p> <p>In the context of our work in Sustainable Systems:  When we study <b>causes</b> of climate change, we are <b>studying affects</b>.</p> <p>When we study and express the <b>results produced</b> (the change that causes produce), <b>we are studying effects</b>.</p> <p><b>When you affect a situation, you create effects.</b></p> <p>No material/object/human exists alone, they affect (produce changes) through and with one another and create effects.</p> <p><b>Affect</b> is a verb. It means to <b>produce a change</b> in or influence something.  New York was affected by severe flooding last summer.</p> <p><b>Pronunciation:</b> ə'fekt, such as adore or sofa</p> <p><b>Effect</b> is a noun that can also be used as a verb. It means a change that occurred or <b>describes results</b>.  When an "s" is added, "effects" means personal belongings.  Transportation has a direct effect on air quality.  Pronunciation: r'fekt, as in eager</p>	<p>see end of document (#3)</p>	<p>25 minutes</p>
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	<p><b>TASK:</b> Take out paper and draw a diagram of the three AFFECTS of climate change you developed and the two EFFECTS of each.</p>		
<p><b>VOCABULARY PRESENTATION (STUDY)</b></p>	<p>Let's study an excerpt from the article "Wicked Problems", from the <i>Depletion Design: Glossary of Networked Ecologies</i> by Wiedemann and Zehle.</p> <p>Distribute vocabulary list related to wicked problems Project slide of 10 Considerations for working with Wicked Problems.</p> <p>Distribute list of related vocabulary words.</p> <p>Rotate around the room inviting students to read/pronounce each word and take turns reading definitions. Students are invited to contribute further explanation to definitions and to provide real world examples.</p> <p>Jamie offers further explanation as needed models back corrections in vocabulary and pronunciation at the end of presentation.</p> <p>Show images of artist Mark Lombardi and Sarah Sze, and Edward Burtynsky's Manufactured Landscapes, as examples of art and design that communicate wicked problems (complex systems).</p>	<p><i>Depletion Design</i> Article, see end of document (#1) and vocabulary list (#2)</p>	<p>20 minutes</p>
<p><b>FOCUSED PRACTICE</b> (Controlled exercise) Application/ Reinforce +</p>	<p>Focus on AND (conjunction) and affects that produce endless causal effects.</p> <p>I'm going to play an 8-minute audio piece from NPR about birds in urban settings. It starts out in at the Highline in New York. <b>Who has been to the Highline? What is it like? Why do you like it there?</b></p> <p><b>TASK:</b> In this piece, listen for the AFFECTS and EFFECTS shared in this piece. Make a list of at least 3 causes and effects that you hear.</p> <p>Designers created the Highline with the intention of creating a "green space" AND something unexpected happened. <b>What was it? Because of this unexpected outcome, designers needed to make new plans and designs. What were they?</b></p> <p><b>TASK:</b> After listening to the audio piece. When the audio is complete, give students several minutes to turn their notes into <b>COMPLETE sentences</b> describing what they heard using affect and effect. (i.e. The unexpected death of birds greatly affected</p>	<p><a href="http://www.npr.org/2012/08/09/157792377/builing-for-birds-architects-aim-for-safer-skies%20">http://www.npr.org/2012/08/09/157792377/builing-for-birds-architects-aim-for-safer-skies%20</a></p> <p>7:48 run time</p>	<p>10 minutes</p> <hr/> <p>20 minutes</p>

	<p>the architect on the program. An effect of this was that the designers set out to create a new type of patterned glass that birds could see but humans could not). Each student reports back to the group a sentence they wrote.</p> <p><b>People/Animals/Things and Materials affect one another and create effects.</b>          Such as: Buildings with reflective surfaces AFFECT bird flight patterns. The resulting EFFECT is that birds accidentally fly into buildings. There are additional, seemingly endless, <b>causal effects</b> that were unexpected and NOT part of the original design intention. These unexpected results created new problems. This is an example of a wicked problem.</p> <p><b>PROJECT IMAGE:</b>  <b>WICKED PROBLEM CHAIN OF EFFECTS:</b>          We create a design (such as the Highline) to make the city more livable  <b>AND &gt;&gt;&gt;</b>          it attracts birds (expected)  <b>AND &gt;&gt;&gt;</b>          night lights attract birds (unexpected)  <b>AND &gt;&gt;&gt;</b>          reflective glass architecture kills birds (unexpected)  <b>AND &gt;&gt;&gt;</b>          we try to design better  <b>AND &gt;&gt;&gt;</b>          attempts to pass laws to protect birds (unexpected)  <b>AND &gt;&gt;&gt;</b>          organizations are formed (unexpected)  <b>AND &gt;&gt;&gt;</b>          humans require aesthetics (expected)  <b>AND &gt;&gt;&gt;</b>  <b>We have responsibilities as designers to not cause harm</b></p> <p><b>Slide:</b> “design is invisible until it “fails”          Rethinking “failure” as change.          How can we as designers, <b>anticipate</b> (see vocab list) change? By better understanding complex earth and human (social) systems and the <b>unpredictability</b> (see vocab list) of their effects.</p> <p><b>Addl. Illustrated Design examples</b> (Jamie)          -social/material affects and effects in the context of:          Geo-Engineering and Climate Change          Fukushima: Energy Generation and Risk</p>		
<b>COMMUNICATIVE PRACTICE FREE EXERCISE</b>	<p>Students work in groups of 2-3 to consider the wicked problem of a blackout in New York City, such as during Hurricane Sandy. Think about materials AND social understandings/desires that</p>		20 minutes

	<p>humans have (comfort, safety etc.)</p> <p>Make a map of causes (affects) and interactions “chain of effects” (and...). In your drawing include at least seven known/expected “ands”/chains of effect (i.e. the power goes out and the food in my refrigerator might go bad.) Also make a list of at least three imaginary things that might happen (i.e. the power goes out AND doesn’t come back on for three days, or AND stores give away free food).</p>		
FEEDBACK/ GUIDED CORRECTION	<p>Convene as group to discuss results and ideas. Maps are hung for an informal crit. Students present in groups (each students speaks) explaining their choices.</p> <p>Jamie then models back corrections in vocabulary and pronunciation at the end of each presentation.</p> <p>Group presentations and discussion. Further modeling, troubleshooting errors and supportive critique.</p>		40 minutes 4 groups, 10 mins/each
CLOSING + HOMEWORK	<p><b>No Zero: Poster</b></p> <p>Distribute brief. Take turns reading through specifications and requirements for submission. Talk through how to conduct research and citation of data.</p>	See attached document	10 minutes

## #1

### WICKED PROBLEMS KEY VOCABULARY LIST

**WICKED PROBLEMS:** a phrase originally used to describe a problem that is difficult or impossible to solve because of incomplete, **contradictory**, and changing requirements that are often difficult to recognize. The term ‘wicked’ is used, not in the sense of evil but rather its resistance to resolution. Because of complex **interdependencies** the effort to solve one aspect of a wicked problem may reveal or create other problems.

**CONTRADICTION:** a combination of statements, ideas, or features of a situation that are opposed to one another

**INTERDEPENDENCIES:** quality or condition of being interdependent, or reliant on each other

**COMPLEXITY:** something with many parts where those parts interact with each other in multiple ways

**ENTANGLEMENT:** to become twisted together or entwining mass

**DYNAMIC:** process or system) characterized by constant change, activity, or progress

**ANTICIPATE:** expect or predict

**UNPREDICTABILITY:** not easily predictable, surprising

## #2

### TEN CONSIDERATIONS FOR WICKED PROBLEMS (from *Depletion Design* reading) (bolded words are vocabulary list)

1. 'there is no **definitive formulation** of a wicked problem';
2. 'wicked problems have no stopping rule – there are no **criteria** for **sufficient** understanding because there are no ends to the **causal** chains';
3. 'the solutions given can never be considered 'true' or 'false' as in other disciplines but rather as 'good' or 'bad'';
4. 'there is no immediate and ultimate test of a solution to a wicked problem';
5. 'there is no opportunity to learn by trial-and-error when dealing with wicked problems – every attempt counts';
6. 'every wicked problem can be approached from various points of **enquiry**';
7. 'every wicked problem is unique';
8. 'every wicked problem is part of another and at times more complex wicked problem';
9. 'the ways in which one chooses to explain a wicked problem determines the nature of its **resolution**';
10. 'when dealing with wicked problems the aim is not the truth but to improve some **characteristic** of the world'

### RELATED VOCABULARY LIST

**DEFINITIVE:** final and settled, with authority

**FORMULATION:** the action of devising or creating something

**CRITERIA:** standard by which something may be judged or decided

**SUFFICIENT:** enough, adequate

**CAUSAL:** the relation between an event (the cause) and a second event (the effect)

**ENQUIRY:** British term for inquiry, defined as: act of asking for information or investigation

**RESOLUTION:** the act of finding an answer or solution to a conflict, problem

**CHARACTERISTIC:** feature or quality belonging typically to a person, place, or thing and serving to identify it

### #3 GRAMMAR NOTES

When you *affect* a situation, you create *effects*.

**Affect** can be used as a verb when trying to describe **influence** rather than cause.

- Rising sea levels can affect the urban coastline negatively.
- The drought affects the crops in California.
- New York was affected by severe flooding last summer.

#### **Effect**

1. If you are talking about a **result**, then use the word "effect" as a noun.

Transportation has a direct effect on air quality.

The global effect of melting glaciers appeared surprisingly fast.

The new law prohibiting sewage from being released into the river goes into effect tomorrow.