

## Wisconsin Educator Curation Project

# Open Education Resource Curation Practice Activity Science

## Welcome and Purpose

The purpose of this training is to provide a practice activity to successfully curate a resource in WISELearn Resources by:

1. Applying an understanding of the Wisconsin Standards for Science, the Next Generation Science Standards, and the OER and in-depth criteria to evaluate the alignment of the materials to the standards.
2. Using the Wisconsin Educator Curation Project process to review materials.
3. Preparing for the in-person training.

As we begin, please remember that the materials you will be curating should be:

- instructional in nature
- should cover **no more than one lesson plan's worth of instruction**

*To begin, please read these two articles that detail how the NGSS utilizes three-dimensional learning. This 3D learning is a key difference between them and past science standards.*

- **Article 1:** <http://nstacomunities.org/blog/2014/04/25/equip/> by Joe Krajcik
- **Article 2, only pages 1-11**
  - [http://www.ride.ri.gov/Portals/0/Uploads/Documents/Instruction-and-Assessment-World-Class-Standards/Science/NGSS/Reiser\\_What\\_PD\\_Strategies\\_are\\_Needed\\_for\\_NGSS.pdf](http://www.ride.ri.gov/Portals/0/Uploads/Documents/Instruction-and-Assessment-World-Class-Standards/Science/NGSS/Reiser_What_PD_Strategies_are_Needed_for_NGSS.pdf) by Brian Reiser

*Reviewing these articles will be helpful in understanding the language used within form.*

## Directions to Begin the Practice Exercise

This document will provide a walk-through exercise of how to contribute a resource in WISELearn Resources. It will also provide evidence and reasoning behind the selection of particular fields of metadata for this resource. It is important to note that the information you provide in the fields about your material is what makes it useable within the system.

- The practice resource we will find here: <https://goo.gl/0mGAnH>
- Please, stop the training module and review this lesson before continuing.
- Helpful tips:

- Use [this document](#) as a reference for navigating the WISELearn Resources repository
- Save your work as you go. Your session can time-out if left open and unused for quite some time. Use Save and continue to stay on the same page.

## Step 1 - Log in to WISELearn Resources at <https://wlresources.dpi.wi.gov/>

- Click [Log In in the menu](#)
- Enter your email and password
  - **Username: your email address**
  - **Password: wiselearnrocks**
  - Please be sure to change your password once you have logged in with the generic information
    - To change your password, click on the top right option for “edit user details” (which is your login/email address) and select “change your password”
- On the left hand navigation bar, or using the blue box at the top of your screen, click the “[Contribute link](#)” to begin the process of reviewing and contributing a resource.
- For this practice exercise, be sure to select the “Practice” collection
  - Note that when you will contributing an actual resource, you will need to select the “Wisconsin Educator Curation Project”

### Gateway Criteria

This first set of questions serves to screen out materials with fundamental flaws that would make them inappropriate for WISELearn. During your curation day, you will discuss these questions with your teammates and reach consensus on next steps.

WISELearn Field	Example Resource Notes
<b>Name of the Resource (Title)</b>	Write in the title of the resource and subtitle if appropriate. <ul style="list-style-type: none"> <li>● Close Reading Frost</li> </ul>
<b>Classroom Subject</b>	Check the primary subject area(s) for the resource, in this case, Science. Then, select the specific science discipline(s) it best connects to.
<b>Access Rights</b>	<ul style="list-style-type: none"> <li>● Yes, this is an open access material that is freely available and does not require any registration or membership (if a free registration is required for a resource, note “other” and describe that need).</li> </ul>
<b>Alignment to WISELearn Vision</b>	<ul style="list-style-type: none"> <li>● We would check the first box, as this resource is relevant for a Wisconsin teacher.</li> <li>● Here we would ask, is this context relevant to our students, or could the material be modified so that it is?</li> </ul>

	<ul style="list-style-type: none"> <li>● We would also check the second box, as we see how it could be meaningfully used in a classroom and have ideas for making it even better.</li> <li>● This resource is unbiased and free of student privacy issues, so we would select yes on each.</li> </ul>
<b>Partner Review</b>	<ul style="list-style-type: none"> <li>● Yes, we would expect your team to agree that this resource meets the gateway criteria.</li> </ul>

## Step 2 - Complete Details about the Resource

- Complete the rest of the fields with descriptive and evaluative information about a resources.

WISELearn Field	Example Resource Notes
<b>What is Your Resource?</b> <ul style="list-style-type: none"> <li>● Resource URL</li> <li>● Attachments</li> <li>● Ownership</li> <li>● Author/Creator</li> <li>● Publisher</li> <li>● Date Created</li> <li>● Language</li> </ul>	<ul style="list-style-type: none"> <li>● Select “Resource URL” and “+ Add resource,” then copy in the url of the resource itself, (not a collection of resources). In this case that would be the link to the lesson: <a href="https://goo.gl/OmGANH">https://goo.gl/OmGANH</a> (using the Google link here because the actual lesson is no longer online). You will also be prompted to add a descriptive title for the resource, in this case I would add, “Simulating Ecosystems and Competition with Non-Native Species: Rusty Crayfish.” I would not use the lesson title, “Rust Never Sleeps,” as that tells me nothing about the resource.</li> <li>● If you had supplemental resources that you’ve created related to this lesson, you could attach them here.</li> <li>● If you created the main resource (not the attachments), note yes here. In this case we mark no.</li> <li>● The authors of the lesson seem to be the three “travel agents” listed at the end: Tim Prange, Dave Guritz, and Mary Mickus.</li> <li>● The publisher in this case is the organization that created the original website hosting the lesson, the Illinois-Indiana Sea Grant College Program - <a href="http://www.iisgcp.org/">http://www.iisgcp.org/</a>.</li> <li>● There is no date listed anywhere, so leave it blank.</li> <li>● The language is English.</li> </ul>
<b>Description</b>	<ul style="list-style-type: none"> <li>● Next you have some editing tools to write a description of the resource <i>in your own words</i>. While you can use the information on the resource as a reference, having the description in your own words will make it more meaningful to other educators. Note the basic outline of the lesson and other useful resources provided. For this lesson, here is a sample description: “In this simulation activity, students take on roles of different</li> </ul>

	<p>species of aquatic animals including one invasive species, the rusty crayfish. Students compete for food (poker chips) with rusty crayfish having an advantage, and they graph species abundance after each round to see trends. Students then have a class discussion about the experience (ideally writing answers as groups first). Ideas for extension activities are provided.”</p>
<p><b>Guidance Narrative</b></p>	<p>You will provide ideas for teachers on how to improve this resource and use it effectively with a group of students. <i>This is the most important part of your review.</i></p> <ul style="list-style-type: none"> <li>● Describe any changes or extensions you would make, particularly to make the resource better aligned to the NGSS. <ul style="list-style-type: none"> <li>○ For example, we would suggest having students model and predict the impact of other invasive species on further food webs and ecosystems. We would have them extend the assessments to include tasks such as looking at and interpreting actual impact data of invasive species and creating public-service announcements (PSAs) based on their experimental evidence and research.</li> <li>○ Note one of the three following categories for how the material links to the NGSS. It is <b>explicit</b>—states NGSS standards and specific practices directly. It is <b>implicit</b>—the practices, content, performance expectations, and big ideas are there, just not specifically called out. Or, it is <b>suggested</b>—you have to add ideas and extensions to the resource to make it NGSS aligned in terms of the PE, practices, CCCs or content. In this case we would write, “This lesson implicitly links to the NGSS, as it connects to big ideas and practices, but they aren’t explicitly called out.”</li> </ul> </li> <li>● Share suggestions for implementation to include ideas such as: <ul style="list-style-type: none"> <li>○ where it fits in an instructional sequence</li> <li>○ links to mathematics or ELA</li> <li>○ how to group students</li> <li>○ As an example in this case, we would suggest a stronger link to mathematics. We would ask middle school students to model the data mathematically without providing a graph template, and we would ask them to interpret the data in terms of slopes and rates, not just general trends. At the elementary level, we could connect to ELA standards by asking groups of students to discuss and write out question responses, using evidence to support their claims, instead of doing that as a class or individually.</li> </ul> </li> <li>● Note particular strengths and weaknesses of the resource <ul style="list-style-type: none"> <li>○ In this case, we note a strength being that it’s an effective, well-describe simulation-based lesson, with no glaring weaknesses.</li> </ul> </li> <li>● Share ideas for related resources <ul style="list-style-type: none"> <li>○ As one example, we would add that for further information on the topic of rusty crayfish in Wisconsin, you can watch this short video: <a href="https://www.youtube.com/watch?v=3nP7I-OPxZs">https://www.youtube.com/watch?v=3nP7I-OPxZs</a></li> </ul> </li> </ul>

<b>Resource Type</b>	<ul style="list-style-type: none"> <li>● This resource is a lesson plan. Some people have asked if this would also be a learning task. A learning task as one small portion of the lesson plan, where you might only have a description of a short student activity.</li> </ul>
<b>Digital Media Type and Required Technology</b>	<ul style="list-style-type: none"> <li>● In this section, you will identify the type of media and any hardware, software, equipment, instructions, or other materials required for use. None are required in this case.</li> </ul>
<b>Educational Use</b>	<ul style="list-style-type: none"> <li>● This resource is best described as a lesson, so we select curriculum/instruction here.</li> </ul>
<b>Grade Level End User Learning Time</b>	<ul style="list-style-type: none"> <li>● Because this resource aligns to both 5<sup>th</sup> grade and middle school standards, selecting 5, 6, 7, and 8 would be appropriate. I will select 5<sup>th</sup> grade and then hold down the ctrl key as I select 6, 7 and 8. I'll then hit the single arrow to select them all.</li> <li>● The end user of this lesson plan is the teacher.</li> <li>● Enter the approximate/typical time to work with/through the resource for the intended audience. This resource says 30-45 min. I suspect the simulation will take that long and class discussion will take further time beyond that. I would estimate 1 hr, entering it as 01:00.</li> </ul>
<b>Keywords</b>	<ul style="list-style-type: none"> <li>● The keywords are optional</li> <li>● Here we would write in, "invasive species," "ecosystems," and "simulation." There is no predetermined list of science keywords, though as more are entered into the system, they will pop up as options for other users.</li> </ul>

### Step 3 - Evaluate for the Open Education Resource (OER) Criteria

This set of fields provide the quality measures that assures resources surfaced through the Wisconsin Educator Curation Project are high quality and meet the standards for an open education resource.

- WISELearn Resources leverages the work of Achieve Inc, a non-profit multi-state entity that has developed quality rubrics for measuring open education resources, as well as high quality standards-aligned content.
- The resources curated through this project have an additional measure of quality control.

WISELearn Field	Example Resource Notes
<b>Quality of Explanation of Subject Matter</b>	<ul style="list-style-type: none"> <li>● In relation to this rubric, there are good descriptions of ecosystems and invasive species in this lesson, though some further details will likely be needed. Thus, we would select “2-strong.” As a reminder, you should have clear reasoning for your selected response. A particular material might not have content explanation as a purpose (like a video clip of a bee pollinating a flower), and N/A could be appropriate in such a case.</li> </ul>
<b>Quality of Instructional Support Materials</b>	<ul style="list-style-type: none"> <li>● For this rubric you will be evaluating the overall quality of instructional materials. In this case, we would rank this material as a “2-strong.” It provides good directions for doing the activity, offers background information, and suggests extensions. It is not a “3” as it does not include supports such as timeframes, possible misconceptions, or ideas for differentiation. Again, N/A will be appropriate for some materials, such as an online simulation or video by itself.</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>● Many resources might not include assessments during your curation. N/A might be a likely choice, but assessments are powerful tools and should be commented on where appropriate.</li> <li>● In this case, the lesson notes additional tasks for assessment purposes in #6. The first is potentially a performance task requiring deeper thinking, while the second, third and fourth may only require fact-based analyses or copying ideas from extended research. An assessment like the first requiring student modeling (an NGSS practice) could meet the level of “3-superior” if it had further details on how to do it. The other assessments listed could also be more</li> </ul>

	<p>open-ended performance tasks depending on how students are asked to conduct them. As laid out, with limited supports for using these assessments and a likelihood that they would be used in a more fact-based way, we would likely select “1-limited” for these assessment ideas. I could give it a “2-strong” if I noted suggestions in the guidance narrative for improving these assessments, connecting to the science practices and giving ideas to ensure they’re not just fact-focused.</p>
<p><b>Opportunities for Deeper Learning and Student Engagement</b></p>	<ul style="list-style-type: none"> <li>● In this activity, students are actively engaged and are asked to answer thoughtful questions in relation to the activity that connect to important science concepts. We would rank this lesson as a “3-superior” in this regard, particularly with extended learning possible through the assessment items. Looking at the list of deeper learning skills, students are thinking critically, working collaboratively, communicating, constructing arguments, and using a model.</li> </ul>

## Step 4 - In-Depth Measures of Science Material Quality

This set of fields provides additional criteria related to a specific subject matter. These in-depth measures help further identify high-quality resources in the area. Because there are few science materials available that align to research-based science practice, such as that noted in the NGSS, rankings in this section can be based on extensions you provide in the guidance narrative.

WISELearn Field	Example Resource Notes
<p><b>Standards alignment and depth</b></p>	<ul style="list-style-type: none"> <li>● The <a href="#">NRC's Framework for K-12 Science Education</a> emphasizes three-dimensional science instruction where students investigate phenomena using science practices and connect their engagement with this phenomenon to big picture ideas in science (the crosscutting concepts). They may also be deepening their science learning by defining and designing solutions to engineering problems that require application of content knowledge. In this case, students are walking through their learning in too pre-determined a fashion to rank this lesson as a "4." As I'll note again at the end, it would be better if students had less step-by-step guidance as they determined in groups the implications of the simulation based on their data. This activity clearly deepens student understanding of the phenomena (unlike a #1 answer). We would rank this activity as a "3."</li> </ul>
<p><b>Opportunities for Extension</b></p>	<ul style="list-style-type: none"> <li>● The work done here is purposeful, but extensions would make it more so. If students next modeled and predicted the impact on food webs of other invasive species, then collected and evaluated data on actual changes, and if their assessment included creating public-service announcements (PSAs) based on their experimental evidence and research, I could see this activity being ranked as a "4." As it stands, we would score it as a "3," and note the extensions on the final page.</li> </ul>
<p><b>Depth of Knowledge</b></p>	<ul style="list-style-type: none"> <li>● Webb's Depth of Knowledge (DoK) framework moves from more informational learning to deeper investigations. This activity does not include the deeper creation and investigation of level 4, though it requires students to identify patterns and make predictions. As it stands, we would rank this resource as a "2." But, in the guidance narrative, if you add extensions for further NGSS-based activities such as developing a plan to reduce the impact of rusty crayfish on the ecosystem, it could be ranked as a "3."</li> </ul>

## Step 5 - Identify the Educational Frameworks and License Type

This set of fields provides additional criteria related to educational frameworks.

WISELearn Field	Example Resource Notes
<p><b>Standard Alignment</b></p>	<p>Considering the alignment to specific science standards, first, we look at the science and engineering practices.</p> <ul style="list-style-type: none"> <li>● In this simulation, students are primarily using the practices of “analyzing and interpreting data” from the simulation and “constructing explanations” based on that data. They are using a model, as the simulation here is a model of species interaction in an ecosystem. But they did not develop the model, and the lesson doesn’t really call out the modeling as explicitly as it could. So, I could see modeling only if you talked about that in the teacher notes at the end. I don’t think I would call this conducting an investigation. They may ask questions, but doing so is not a primary emphasis. There is some use of mathematics in creating and analyzing the graph, but this work appears secondary to the data collection and analysis elements, as students are not doing their own mathematical modeling or deeper mathematical trend analysis (such as comparing slopes of lines). Students are not arguing for different interpretations of data or different solutions based on evidence, and they are not obtaining or communicating information, though these tasks and practices could be parts of your suggested extension activities. NOTE: If there are no practices inherent in the material (as in a video clip of a train car imploding), you can base your answer to this question on your suggested use of this activity and should note that on the final suggestions page; otherwise, your answer should be based on the material itself.</li> <li>● The disciplinary core ideas (DCIs) describe the content of the material. You will copy and paste the title of the disciplinary core ideas from the NGSS standards. You can find these on the Three Dimensions reference page, and you can find more details on the standards pages for your grade level - <a href="http://nextgenscience.org/search-standards-dci">http://nextgenscience.org/search-standards-dci</a>. For this resource, I would look to upper elementary or middle school, as that’s the designated grade range. Looking for ecosystems, I see that grade 5 has a focus on ecosystems in <a href="#">5-LS2 - Ecosystems: Interactions, Energy, and Dynamics</a>. Looking at the details in the orange box on this standards page, I see that “LS2.A Interdependent Relationships in Ecosystems”</li> </ul>

	<p>includes the topics of food webs, healthy ecosystems, and new species damaging the balance of ecosystems. I would copy and paste in this DCI title (LS2.A.). Looking at the middle school version of the DCI for interdependent relationships in ecosystems, MS-LS2.A, I see that it is also relevant, particularly the phrase, “in any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.” So, I would also note MS-LS2.A. You may find that DCIs from more than one discipline are appropriate.</p> <ul style="list-style-type: none"> <li>● The crosscutting concepts (CCCs) are big ideas that connect thinking across scientific disciplines. In this case students are clearly looking for “patterns” in their data and noting the change in populations (“stability and change”), so we would select those two CCCs. Again, depending on how you frame your extensions or changes to a material on the final page of this form, you might be suggesting CCCs here that aren’t explicitly in the material.</li> <li>● The performance expectations are the bold assessment statements at the top of a standards page. Looking at the PEs on the LS2 pages for MS and 5<sup>th</sup> grade, where we located the DCIs, I see two that relate. In the 5<sup>th</sup> grade, I would note, “5-LS2-1, Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.” Students are not developing a model here or working with the clarifying idea that plants change non-food matter into food, but they are using a model. And, they are looking at food as matter transferred within a particular system. It is okay for materials to address a portion of a PE and not a full PE. It will take multiple lessons and investigations to fully cover PEs. At the middle school level, “MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem” also directly relates to this activity. Other PEs could be tangentially related here, particularly within extension activities, but we selected the two most relevant to this particular material.</li> </ul>
<p><b>Promoting Excellence for All</b></p>	<ul style="list-style-type: none"> <li>● Indicate which of the categories of Wisconsin’s Promoting Excellence for All initiative, an achievement gap reduction effort, this resource is best aligned to “Effective Instruction.” For more information on Promoting Excellence for All, visit <a href="http://dpi.wi.gov/excforall">http://dpi.wi.gov/excforall</a></li> </ul>
<p><b>Universal Design for Learning (UDL)</b></p>	<ul style="list-style-type: none"> <li>● UDL parallels three distinct learning networks in the brain used in learning: recognition, strategy, and affect. The respective UDL Principles offer scientifically-valid supports for learner access to information - or Representation, to being motivated to learn - or Engagement, and to demonstrating what the learner can do, or Action and Expression. UDL conveys the need to reduce curriculum barriers with intentional planning to address learner variability through the use of multiple methods, providing options which maximize learning for the greatest number of students.</li> </ul>

<b>License Holder and Type</b>	<ul style="list-style-type: none"> <li>● There is no copyright or license information indicated on the lesson itself, and looking at the hosting website, we still cannot find any copyright information.             <ul style="list-style-type: none"> <li>○ For license holder, there is no specific information provided. There is no “terms of use” section of the website, as in some cases. So, enter the name of the organization as the license holder, Illinois-Indiana Sea Grant College Program.</li> <li>○ With no other information provided, select the first option, “Copyright © - all rights reserved,” as the default.</li> </ul> </li> </ul>
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*Congratulations! To finish submitting your resource, click “save” and “submit.” You’ve successfully uploaded a high-quality resource for moderation into WISELearn Resources that will benefit many Wisconsin teachers. A subject matter-expert will review your review prior to approval. Share your work with your teammates for their feedback.*

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## Further work to complete before your in-person curation day

### Find 4-6 resources to use in your in-person work day

From your own experience and connections, identify 4-6 examples of instructional materials to suggest for inclusion in WISELearn Resources. These materials should be at the level of lesson or finer-grained, not full units or curricula. You’ll find a list of suggested sources for OER on the Training site.

### Practice Exercise

Please note that you will **not** receive your training stipend without successful completion of the training activity. We will start the work day by discussing reviews of this resource as a group to ensure that all of us are approaching resources in similar ways. In essence, this will be an anchor review.

#### For additional practice in curating a science resource

- **Practice Resource:**  
<http://www.discoveryeducation.com/teachers/free-lesson-plans/the-case-of-similar-substances.cfm>

#### Suggested websites for excellent resources in science

 WISELearn Resources

- Many links here: <http://www.cesa2.org/programs/stem/scienceinstruction.cfm>,
- NSTA - [www.nsta.org](http://www.nsta.org) - you can find free things (but be careful you're not signed in as a member when you go there, so you don't pull up resources only available to members)
- SciGirls: <http://www.pbslearningmedia.org/search/?q=scigirls>
- Local things can be great for engagement, DNR: <http://dnr.wi.gov/> - click on the "Education" tab.
- Into the Outdoors: <http://intotheoutdoors.org/>
- Wisconsin KEEP: <http://www.uwsp.edu/cnr-ap/KEEP/Pages/default.aspx>
- NASA - <http://www.nasa.gov/education/resources/#.VPdOuvnF-So>
- Several engineering education sites:  
<http://www.cesa2.org/programs/stem/engineering.cfm>
- 10 good ideas here (I like PhET) -  
<http://www.edutopia.org/blog/websites-for-science-teachers-eric-brunsell>
- Challenges! <https://www.challengebasedlearning.org/pages/welcome>
- Buck Institute for Education, focusing on PBL, search on right side:  
<http://bie.org/resources>
- National Science Digital Library <https://nsdl.oercommons.org/>