OER #2 - Building Bridges to Language Arts

Erich Forler 427500
University of Ottawa

EDU 3119

Submitted to: Michelle Hagerman

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Project Title:	Building Bridges to Language Arts	Hours Required for Project:	8
Created by:	Erich Forler	Intended Grade:	7
Subjects:	Science (Structures) and Language Arts (Oral, Media Literacy).		

Summary

In this unit, students design and construct a bridge from rudimentary materials that must withstand a specified amount of force. This activity is based on the Ontario Grade 7 Science curriculum expectation and the reporting requirements for the project address Language Arts curriculum expectations. It also addresses the International Society for Technology in Education (ISTE) standards.

Students have to follow a project plan to build a bridge and at the end of each phase, they need to report on their progress using either a video recording, audio recording, slideshow with photos and text, a blog with photos/videos, or PDF with photos and text of what they have done and what they are thinking about their project. Audio and Video recordings should be edited to include introductory and closing titles, etc. If students choose to do a blog, pdf or slideshow, they will need to present them to the class as the assessment of the language components is based on the Oral strand curriculum expectations.

There are multiple phases to the lesson; design and budget, prototype construction, prototype design review, redesign and construction, testing, final report creation.

While this lesson plan covers eight, 1-hour classes, because it is cross curricular with Language Arts, more time could be allocated to facilitate a more in-depth report generation process and a higher quality product.

Digital Literacies Skills

Making and Remixing (MediaSmarts)

This lesson addresses the Making and Remixing skill from the MediaSmarts framework by requiring the students to:

- Record their project progress using a video camera/tablet/phone.
- Take a series of photographs to illustrate key features of their project.
- Edit photos/video/audio using on-line editing tools.
- Assemble digital assets into a coherent story about their project.

Using Spreadsheets

While not explicitly part of the MediaSmarts framework or the Ontario curricula, students should learn how to use spreadsheets, so it's included here under the category of "making".

Justification

Delivering a message can often be done in many different ways, so this project provides students with an opportunity to choose a method that appeals most to them while still requiring all of them to use their oral skills to communicate their message. Their oral communication is enhanced by them creating, manipulating, editing audio, video, photos and text to expand the understanding and reach of their message. Students who can master these skills will be more effective communicators in school and in the workplace.

According to Korby "the average 8 to 12-year-old spends about six hours a day in front of a screen, and teenagers spend more than nine" (Korbey, H., 2018) which means that digital communication mediums are how children and youth communicate. It's a reasonable extrapolation that students should be developing skills that allow them to communicate effectively in those digital mediums. Whether it's an instant message, blog post, Snap-chat, youTube video or Tik-Tok, they need to learn the skills that allow them to harness the medium. (Forler, 2020)

"Connecting video production to school-based reading and writing experiences in school taps into a students predisposition for media consumption and production." (Spires et al, 2012) so the ability to make effective digital resources is an essential 21st century skill. This lesson taps into the Ontario curriculum Language Arts requirement for Oral communications and allows them to deliver their message orally, either live or through recorded media.

"Social interaction, especially in its prototypical form of face-to-face communication ... tends to be transient" (Livingstone, S., 2014). A face-to-face presentation, as is often done in a business situation, delivers a message orally and is typically supported by other digital artifacts that are constructed to support the oral message. Those supporting artifacts (slideshows, documents with links, videos, Web pages) serve as a persistent record of the transient message delivered in the live presentation.

Curriculum Expectations Addressed

All of the following expectations can be addressed through this lesson plan.

Science: Structures and Mechanisms

Overall Expectations

2. design and construct a variety of structures, and investigate the relationship between the design and function of these structures and the forces that act on them;

3. demonstrate an understanding of the relationship between structural forms and the forces that act on and within them.

Developing Investigation and Communication Skills

2.4 use technological problem-solving skills (see page 16) to determine the most efficient way for a structure (e.g., a chair, a shelf, a bridge) to support a given load

2.6 use appropriate science and technology vocabulary, including truss, beam, ergonomics, shear, and torsion), in oral and written communication

Understanding Basic Concepts

3.3 identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure

3.5 describe the role of symmetry in structures (e.g., aesthetic appeal, structural stability)

Language Arts: Oral

Overall Expectations

2. use speaking skills and strategies appropriately to communicate with different audiences for a variety of purposes;

Clarity and Coherence

2.3 communicate orally in a clear, coherent manner, using a structure and style appropriate to both the topic and the intended audience (e.g., use a formal structure of opening statement, enumeration of points, and summary/conclusion, and a straightforward, impersonal style, to present a position statement on an issue)

Appropriate Language

2.4 use appropriate words, phrases, and terminology from the full range of their vocabulary, including inclusive and non-discriminatory language, and a range of stylistic devices, to communicate their meaning accurately and engage the interest of their intended audience (e.g., use the technical vocabulary of the subject area during a scientific investigation in a group setting; incorporate literary language and structures into personal anecdotes or imaginative narratives; use emotive language in a persuasive appeal to a large group)

Language Arts: Media Literacy

Overall Expectations

3. create a variety of media texts for different purposes and audiences, using appropriate forms, conventions, and techniques;

Producing Media Texts

3.4 produce a variety of media texts of some technical complexity for specific purposes and audiences, using appropriate forms, conventions, and techniques

ISTE Standards Addressed

Innovative Designer

4b Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

4c. Students develop, test and refine prototypes as part of a cyclical design process.

Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

6a Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

6b Students create original works or responsibly repurpose or remix digital resources into new creations.

6d Students publish or present content that customizes the message and medium for their intended audiences.

Materials

Required

- Video recording equipment (could be a video camera, tablet, cell phone)
- Still photograph equipment (camera, tablet, cellphone)
- Video/audio/photo editing software or software as a service (SaaS) like WeVideo for video and Pixlr for photographs.
- Laptops or Chromebooks depending on the choice of software for editing
- If students will be using WeVideo, it is best to have a paid educators account and create accounts for the students in advance of starting this unit.
  https://www.wevideo.com/signup?p=trial&tier=education&instanceName=WeVideo

Recommended

Most students will be producing some video for their reports, so consider the following:

- Tripod to mount video camera. A stable camera significantly improves video quality.
- If they are including any videos of themselves talking, consider having an attractive backdrop for performances. The videos will be much better if there is an uncluttered background behind the students while they are speaking.
- Have a place where they can video their bridges that is uncluttered.
- Headphones for each computer being used for editing. They're not required, but it cuts down on the noise in the classroom and allows students to make better edits.

Spatial Considerations

These activities can generally be done in class. No special classroom set-up is required; however, finding a space in the school where students could be isolated from other noise while they are recording would be ideal. If that's not possible, consider scheduling time during lunch or recess when students could be alone in the classroom would be an alternative. (Forler, 2020)

UDL Considerations

Students are permitted to choose the method they would like to use for reporting and are free to employ any bridge design that meets the objectives for span and weight support. *Optimize individual choice and autonomy* (UDL 7.1).

The lesson plan includes a prototyping stage before building the final structure which increases the likelihood of a successful outcome of their project. Teachers can provide feedback after the initial design work and during the prototyping stage. These all contribute to increased mastery. *Increase mastery-oriented feedback* (UDL8.4).

The design and prototyping stages allows students to self-assess their work and modify their design and construction approach accordingly. *Develop self-assessment and reflection* (UDL 9.3).

The instructions for the activity are printed as well as being fully explained by the teacher orally. *Offer alternatives for auditory information* (UDL 1.2) *Offer alternatives for written information* (UDL 1.3).

This set of lessons is the culmination of a unit on structures and as such relies on the students' knowledge they've acquired throughout the unit. *Activate or supply background knowledge* (UDL 3.1)

The student handout and slideshow includes bold-face type to draw attention to key words and messages in the assignment. *Highlight patterns, critical features, big ideas, and relationships* (UDL 3.2)

The lesson student handout includes a day-by-day check-list of activities they should be completing each day. *Guide information processing and visualization* (UDL 3.3)

The lesson teachers notes include suggested accommodations/modifications. *Vary the methods for response and navigation* (UDL 4.1)

Students may choose the media that suits them best. All require oral participation as that is what is being assessed but it can take the form of a video, audio recording or live presentation to suit the student. Video and audio recording allow the opportunity for working alone and editing if the student has difficulty performing in front of classmates. In extreme cases where an oral presentation is not possible, the expectations can be modified to written expectations which are similar. *Use multiple media for communication* (UDL 5.1)

Students may use speech-to-text to assist them with writing what they want to say in their videos or podcasts. Students are also given the choice of what their final product will be so they can choose to rely more heavily on printed material rather than audio to communicate the details of their project. *Use multiple tools for construction and composition* (UDL 5.2)

Students may use all the tools at their disposal in the Google G-Suite including spell checkers, grammar checkers, word prediction, speech-to-text, and text-to-speech to assist them in drafting the text for their project. They may use whatever tools they choose for producing their video, podcast, blog, slide-show, or PDF. Regardless of their method of delivery, students are expected to include spoken words, photos and often video in their final report. *Use multiple tools for construction and composition* (UDL 5.2)

This project begins with a design/planning phase and a prototype stage before final construction. This process models good project planning and is reinforced by requiring students to report after each of these milestones. *Support planning and strategy development* (UDL 6.2)This project is done in groups of three and requires collaboration. *Foster Collaboration and community* (UDL 8.3)

Cultural and/or Community Considerations

The nature of their presentation is such that even though they are all required to meet the same communication objectives, they may choose any reporting approach they wish. They might choose a format which reflects something unique to their heritage or community.

English Language Learners

Many of the UDL considerations help ELLs, as do the modifications and accommodations in the lesson.

Working in teams also allows students with weaker language skills to be supported by stronger speakers.

The ability to record multiple takes, select the best take and edit takes some of the pressure off ELLs.

Accommodations

- ELL students may use text-to-speech to produce drafts of their writing.
- Groups may delegate someone in their group to do the majority of the speaking as long as each member does enough to be assessed.

Resources

- Teacher's Lesson Slide Show: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLlr3eIgL3-I
- Student Hand-out: https://drive.google.com/open?id=12OOU6ekQHi5cjhaq9xoXp6mMRNUTRhQvBxINpJG40KM
- Lesson Plan: https://drive.google.com/open?id=1wLZP7WgNCPiWsh4BNIAksRAtPYUzm8oP-kyM1a4Y-dg
- Tutorial video: https://drive.google.com/open?id=1YsFTz2LhBBChTfL2c9wDz_kOIX-beZsZ

Lessons

Description of Learning Objectives by Session and Teaching and Learning Activities

Session 1 - Introduction
Student Learning Objectives for the Session:
Engage in the lesson and understand requirements for this project.
Student learning during this block of time will include the following activities:
• Students meet in their groups and decide which method of reporting they will use (video, audio, slideshow with presentation, PDF with presentation) • Students begin design of their bridge.
To support student learning, the teacher will...
• Use slideshow: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLlr3eIgL3-I • Introduce project • Assign student groups

Session 2 - Design And Budget

Student Learning Objectives for the Session:

Work cooperatively to design a bridge using their knowledge from their science unit on Structures.

Learn to implement column sums and cell calculations in Google Sheets, Excel, or OpenOffice Math.

Learn to record and narrate commentary.

Learn to video and photograph effectively to support their commentary.

Student learning during this block of time will include the following activities:

- Students complete the design of their bridge.
- Students complete the budget based on the design of their bridge.
- Students draft their first report of their bridge design and budget and record it if possible.

To support student learning, the teacher will...

- Give a short tutorial on how to make calculations and sum columns in spreadsheets.
- Use slideshow: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLIr3eIgL3-I

Session 3 - Prototype Construction and Testing

Student Learning Objectives for the Session:

Work cooperatively to construct and test the bridge that follows their design.

Learn to record and narrate commentary.

Learn to video and photograph effectively to support their commentary.

Student learning during this block of time will include the following activities:

- Students complete the construction of their prototype bridges.
- Students should do some testing on their prototype.
- Students chronicle the construction process in photos, video, and in text (to help with reporting afterward).
- Students should identify any changes they made to their design as they progressed in their report.

To support student learning, the teacher will...

- Use slideshow: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLIr3eIgL3-I

Session 4 - Prototype Performance Review

Student Learning Objectives for the Session:

Apply knowledge of loads and internal forces to assess bridge performance during testing and consider design changes to improve performance.

Evaluate prototype performance issues and cost saving changes.

Learn to record and narrate commentary about their bridge design.

Learn to video and photograph effectively to support their commentary.

Student learning during this block of time will include the following activities:

- Identify and discuss weaknesses or areas for improvement in your design or construction technique.
- Identify any changes you could make which would reduce the cost of your structure without significantly weakening the bridge.
- Create the report on your prototype and testing including suggested changes.

To support student learning, the teacher will...

- Use slideshow: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLIr3eIgL3-I
- Remind students about internal forces and how they can affect their design.

Session 5 - Redesign and Construct

Student Learning Objectives for the Session:

Apply experience in testing and knowledge of internal forces to revise design in order to reduce cost and address any performance issues with the bridge.

Student learning during this block of time will include the following activities:

- Revise your design based on your prototype experience to correct weaknesses, improve your design and/or reduce cost.
- Either create a new drawing or modify your existing drawing indicating where changes will be made.
- Start building a new bridge to meet your new design or modify your existing bridge.

To support student learning, the teacher will...

- Use slideshow: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLIr3eIgL3-I
- Support students in their redesign and construction processes.

Session 6 - Finish Construction

Student Learning Objectives for the Session:

Work cooperatively to construct and test the bridge that follows their revised design.

Student learning during this block of time will include the following activities:

- Finish constructing bridge.
- Report on your final construction and anything that is different from the revised design that happened during construction.

To support student learning, the teacher will...

- Use slideshow: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLIr3eIgL3-I
- Support students in their and construction process.

Session 7 - Final Testing

Student Learning Objectives for the Session:

Learn to record and narrate commentary about their bridge design.

Learn to video and photograph effectively to support their commentary.

Student learning during this block of time will include the following activities:

- Test their final bridge designs.
- Begin working on their final reports.

To support student learning, the teacher will...

- Use slideshow: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLIr3eIgL3-I
- Supervise official classroom testing.
- Support students in their report production.

Session 8 - Final Reporting

Student Learning Objectives for the Session:

Learn to combine multimedia elements (text, video, audio, photos, diagrams) to create an effective presentation.

Student learning during this block of time will include the following activities:

- Finish their reports.

To support student learning, the teacher will...
• Use slideshow: https://drive.google.com/open?id=13zUm5UWWhDAXI0LfWx0USaQX3eR36-nuLIr3eIgL3-I • Prompt students with questions that they should be including in their reports • Give students suggestions on things they should be including depending on the type of report they're creating. • Support students in their report production.

References

Forler, E. (2020). OER #1 - Slam + Video. University of Ottawa: unpublished essay.

Korbey, H. (2018). Digital text is changing how kids read -- just not how you think. KQED. Retrieved from https://www.kqed.org/mindshift/49092/digital-text-is-changing-how-kids-read-just-not-in-the-way-that-you-think

Livingstone, S. (2014). Developing social media literacy: How children learn to interpret risky opportunities on social network sites. *Communications, 39*(3). Retrieved from: https://doi.org/10.1515/commun-2014-0113

Spires, H.A., Hervey, L., Morris, G., & Stelpflug, C. (2012). Energizing project-based inquiry: Middle-grade students read, write and create videos. *Journal of Adolescent and Adult Literacy, 55*(6), 483-493. https://doi.org/10.1002/JAAL.00058