Project-Based Learning

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PROJECT-BASED LEARNING LESSON 1 (PBL1): Problem Identification

Skills Taught	Agenda Overview
Problem-solving, collaboration, perspective taking, listening to competing viewpoints	In this lesson, students will brainstorm "quandaries" in their community and will identify one quandary as the primary focus. In future lessons, students will use this quandary to walk through the problem-solving process, brainstorming solutions and presenting a proposal.

Lesson Goals	Materials
Expand on knowledge gained through QE 1. Choose a quandary to problem-solve for next 3 lessons.	Poster paper or whiteboard Problem-solving Process (PBL1.S1) or student-made poster from QE1 Exit ticket (PBL1.S2)

IMPLEMENTATION GUIDE

Lesson Structure (Total Time: 30-35 minutes)	Teacher Notes
EXPLAIN to students, "Now we're going to change the focus from Quandary and Braxos to our own school community. Let me remind you of what a quandary is (write this on the board or projector): a quandary requires you to make a **difficult decision** in which there are **no clear right or wrong answers** but **important consequences** to yourself and your community. Let's brainstorm some quandaries that come up in our community."	
DIVIDE class into pairs and have students brainstorm school-related quandaries on a sheet of paper. Encourage students to generate at least 5 quandaries that they will share with the class when they're done brainstorming.	
COLLECT student responses by writing them on the board or using the Poll Everywhere tool (www.polleverywhere.com). Ask each student group to share the quandaries they generated.	
ASK for more information from multiple students, "Which one of these problems stands out most to you and why? How do we know this is a problem for our community?"	
CAST a vote by having students place a tally next to the problem they want to "workshop" over the next three lessons, or have students raise their hands - eyes opened or closed depending on their level of comfort.	
PROVIDE an overview: "The rest of our lessons will be like this – first, we'll have a class playing Quandary and the next class will focus on our own project, walking through the problem-solving process with our own school's quandary. Next week, we'll be following along with the problem-solving steps by defining our problem, answering "Who, What, When, Where, Why and How" to make sure we understand it.	

Wrap-Up

As an exit ticket, have students write the problem they chose and why it is a problem in their school community.

Additional Resources

Example Quandaries: *uniforms, detention policy, extended day programs, energy use, computers in schools, bullying policy, cafeteria food, privacy within school; stereotyping, prejudice, cyberbullying*

PROJECT-BASED LEARNING LESSON 2 (PBL2): Problem Definition

Skills Taught	Agenda Overview
Problem-solving (problem definition and analysis), methods of inquiry, data collection, surveying	In this lesson, students will build on the problem they selected last class and will apply methods of inquiry (generating questions, surveying stakeholders) to gain a further understanding of the problem before brainstorming solutions in the next lesson.

Lesson Goals	Materials
Apply Digital Literacy Skills gained through QE2. Learn more about the school-based quandary from relevant stakeholders to inform solution finding.	Problem-solving Process (PBL1.S1) or student-made poster from QE1 Word Processing Software and Printer Survey Template (PBL2.S1)

IMPLEMENTATION GUIDE

Lesson Structure (Total Time: 30-35 minutes)	Teacher Notes
ORIENT students. "Today, we're going to take the problem we identified last class and dissect it. We want to understand the problem so that the solution we choose makes sense. Like we do in Quandary, we're going to find out more about the problem from all the people it affects: let's brainstorm together a list of people who are affected by this particular problem." Brainstorm with students and collect their answers on the board.	
ASK, "Now that we have a list of the people affected, what might we want to ask them to make sure we understand the problem from their perspective? A tip for asking good questions is to use the '5 W's and an H'. *Who, what, when, where, why,* and *how*: these kinds of questions will nearly always help us understand the problem better." Divide students into small groups of 3-4 and instruct them to write down 5 questions using the 5 W's.	
CHOOSE a leader from each group to share the list of questions they created. After sharing, collect the papers and tape them to the board, spaced about 1-2 feet apart. Invite the students to come up to the board and place a tally next to the questions for which they're most curious to have the answer. *Scaffolding: encourage students not to pick their own question, instead think about what questions will help to choose a solution.*	
ENTER the top 3 questions into the Survey Template in Supplemental Materials. Print two copies for each student: one for them, and one for them to use for interviewing stakeholders. Using the list of people affected by the problem, let students choose who they will interview.	

Wrap-Up

As an exit ticket, have students complete and turn in their survey copy. One option is to assign students to interview their identified stakeholder and bring their results with them to the next class. Offer to support students with tougher stakeholders (e.g., principal, staff, and other non-student community members). Another option is to arrange for a panel of stakeholders to come into class for students to interview during class time.

Additional Resources

Example Questions: *Who is responsible? Who can help fix this? What about X makes it a problem? What would it be like if X weren't a problem in our school/community? What would need to be removed so that X isn't a problem anymore? What are the facts about X in our school/community? When is X most likely to take place? When did the problem start? Where did the problem start? How does X happen? How might we stop it from happening?*

PROJECT-BASED LEARNING LESSON 3 (PBL3): Generating Solutions

Skills Taught	Agenda Overview
Creative problem-solving, collaboration, innovation, leadership decision-making, solution finding, critical thinking	Students will practice leadership by brainstorming solutions to the problem they identified and analyzed. As they generate ideas, students will engage in collaborative problem-solving and critical thinking, empowering them to become agents of change.

Lesson Goals	Materials
After Lesson QE 3, students will generate solutions to the chosen problem based on the results from last week's survey.	Poster paper for large Pro-Pro charts or Pro-Pro Chart Handout (PBL3.S1) Exit Ticket (PBL3.S2)

IMPLEMENTATION GUIDE

Lesson Structure (Total Time: 35-40 minutes)	Teacher Notes
WARM UP by asking students about their ideas for the worst restaurant of all time. Divide students into small groups and have each group take one idea. In groups, direct the students to turn the negative into a positive and explain what could make that restaurant the best of all time. (This activity gets students creatively brainstorming, noting that even the most unworkable ideas have merit.) Invite groups to share their creative solutions.	
ORIENT students. "Today, we'll be brainstorming solutions to our problem based on what we found through the surveys. But first, we have to read what our stakeholders said before we can come up with the best solution." Provide a quick definition of 'stakeholder'. Create a gallery walk of completed surveys from both stakeholders and students and have students spend 10 minutes reading the responses. Encourage them to take notes, writing anything surprising or helpful they learn while reading.	
DIVIDE students into groups of 3-4. Say, "Now that we've read our survey results, let's think of as many solutions to the problem as we can. I'm going to set a timer for 5 minutes – try and write down as many solutions as possible and remember that no idea is a bad idea. Ready, set, go!" Set the timer.	
PROVIDE each group with poster paper and markers. Instruct them to draw a line down the middle, creating a pro-pro chart. Say, "Now, take your two best solutions from that list and write them on the paper: put one solution on the left and the other on the right. Then, write down a few pros for each solution. Remember, no cons – only pro's."	
CHALLENGE students to generate a third way – a solution that combines the pros listed from the two solutions. If after 5 minutes, students cannot generate a third solution – encourage them to choose the option with the most powerful pros.	
SHARE solutions by choosing a leader from each group to talk about the solution they chose and why.	

Wrap-Up

As an exit ticket, have students write down which solution they would choose and a brief sentence or two explaining their decision.

Additional Resources

TEACHING STRATEGY *Integrative Thinking*	http://www.rotmanithink.ca/

PROJECT-BASED LEARNING LESSON 4 (PBL4): Creating a Proposal

IMPLEMENTATION GUIDE

Lesson Structure (Total Time: 35-40 minutes)	Teacher Notes

Presentation, long-term planning, data analysis and interpretation, problem solving application

TELL students, "Today, in your solution groups, we are going to put together everything we've done so far in preparation for the culminating project. You can make a poster, PowerPoint presentation, or a video to showcase your work, as long as it has these four sections: Problem Identification, Problem Study, Solution, and Next Steps."

Teacher Notes: Students will draft a proposal that includes the following sections: Problem Identification, Problem Study, and Solution, and Next Steps. Students will prepare to present their proposal to a panel of stakeholders (teachers, admin, other students, and staff).

Lesson Goals	Materials

WRITE the section titles on the board. Give students access, PowerPoint, video making tools and walk around and provide planning/scaffolding support to groups as needed. Encourage students to use graphic organizer. Ask each group to decide on a presentation form (poster, PowerPoint, Prezi, or video – ultimately at teacher discretion).

Students will prepare a presentation for stakeholders about the problem and their proposed solution.

Materials: Internet access, PowerPoint, video making tools; Graphic organizer (PBL4.S1); Poster boards, printer, paper, scissors, glue, markers

PROVIDE students with the completed stakeholder surveys for reference. Place the surveys on a desk in a common area of the classroom and encourage students to use them to build their "Problem Study" section.

MONITOR student progress on content creation and provide supportive scaffolding as necessary. Help students brainstorm their Next Steps section by asking questions (What can be done to make progress towards this solution? Who's responsible for doing it? When could they do it?)

PRACTICE presenting to one another by having groups pair off and take turns making their presentation. Define the parameters for the presentation: an 'elevator speech' of 1-2 minutes summarizing their project for stakeholders.

Wrap-Up

As an exit ticket, students should have a complete or near-complete presentation. If not yet complete, decide with the student when they will complete their project before the presentation day.

Additional Resources

VIDEO *Three Tips for Giving a Presentation*   https://www.youtube.com/watch?v=fAnjk3GkGtg

BLOG *How to Scaffold Project-Based Learning*   https://www.bie.org/blog/scaffolding_content_and_process_in_pbl

PROJECT-BASED LEARNING LESSON 5 (PBL5): Culminating Project

Skills Taught

Presentation skills, critical thinking, responding to stakeholders, project proposal, leadership

Agenda Overview

Students will present their projects to a group of relevant stakeholders in a poster presentation format. Stakeholders will float between groups of students, asking questions for the students to ponder and answer.

Lesson Goals

Students will gain experience proposing their creative solutions to their selected problem to an audience of relevant stakeholders.

Materials

Completed posters/projects and venue for presentation

Prep: Find a panel of relevant stakeholders to attend the presentation (at least one school admin, other teachers, other students, staff, etc.)

Exit Ticket (PBL5.S1)

IMPLEMENTATION GUIDE

Lesson Structure (Total time: 45 minutes)	Teacher Notes
OVERVIEW the experience for students. "Today is the big day! We're going to set up our presentations around the room and wait for stakeholders to come and ask questions. Look over your projects and be prepared to answer some questions about your work. Also, don't be afraid to ask the stakeholders questions: for example, it's okay to ask, 'Could you see this working in our school? What do you think of this solution? How would you solve this problem?'"	
HELP students with the display of their projects and provide pep-talks as needed.	
FACILITATE conversation between students and stakeholders. Rotate from group to group, ensuring student engagement with the process.	
REFLECT with the entire class at the end of the presentation. "How do you think it went? What stood out to you or surprised you about what the stakeholders had to say? Do you still stand behind your solution or did anything change your mind? How did it feel to be in a leadership position, being the expert and advocating for change? What would you like to see happen as a result of this presentation?"	
CONGRATULATE students for participating in the problem-solving and solution finding process, emphasizing the growth you've seen in particular students or groups over the course of the curriculum.	
ENCOURAGE students, if applicable, to act on their proposed solutions. Say, "Remember that change starts with you. If you want to see a change, you have to be the change." Ask students to share aloud the steps they will take to move towards their solution, if applicable.	

Wrap-Up

As an exit ticket, have students complete the Thinking Routine worksheet responding to these two open-ended questions about their chosen problem: "I used to think…." "But now I think…" Acknowledge student's hard work and skill-building over the course of the curriculum.

Additional Resources

TEACHING STRATEGY *Thinking Routines*

http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03a_ThinkingRoutines.html

Project-Based Learning Lesson 1: Problem-solving Process

What is Social Problem-solving? [1]

Social problem-solving is the cognitive-behavioral process that an individual goes through to solve a social problem. Typically, there are five steps within this process:

1. *Identifying that the problem exists*: Recognizing there is a problem that needs to be solved.
2. *Defining the problem*: Naming and describing the problem.
3. *Generating solutions*: Coming up with many possible solutions for the problem.
4. *Evaluating solutions and enacting the chosen solution*: Evaluating each possible solution to select the one that is most likely to solve the problem, and then effectively carrying out the chosen solution.
5. *Assessing the outcome*: Determining whether the problem was solved or not. If the problem was solved, no need to repeat the process. If the problem still exists or if another problem appears, the process might need to begin again.

For many competent problem solvers, this process can be automatic and skilled social problem solvers may not go through the process in a linear fashion or even realize the steps they take to solve the problem. Students who are limited in their problem-solving ability, however, must be taught explicitly the step-by-step process.

(1) Adapted from University of Florida College of Education. https://education.ufl.edu/behavior-management-resource-guide/2015/01/16/teaching-students-to-solve-social-problems/

Project-Based Learning Lesson 1: Exit Ticket

Name: _____ Date:

_____

Directions: Answer the following questions before leaving class.

1. What problem did you choose?

2. In what way(s) is it a problem and why is it important to find a solution?

Project-Based Learning Lesson 2: Survey

Name: _____   Date: _____

Identified Problem: _____

Interviewee Name and Role: _____

Interview Questions:

   1.

   2.

   3.

Is there anything else you'd like to say about this problem?

Project-Based Learning Lesson 3: Pro-Pro Charts [3]

Most people are familiar with pro/con charts, but in a pro/pro chart the group thinks through the positives of two different ideas. Rather than deciding between two choices, this tool helps students identify the positive traits of different viewpoints, and then create a third option by merging the good qualities of both. Use a Pro/Pro chart to come up with your own third solution.

Directions: Write each solution in the solution boxes and brainstorm the pros of each solution underneath. Then, think about and write a new solution in the box below.

PROS	PROS
SOLUTION 1:	SOLUTION 2:
+	+
+	+
+	+
+	+
+	+
+	+

NEW SOLUTION:

(1) Excerpted from KQED.org, MindShift Educational Strategies: https://www.kqed.org/mindshift/46781/three-tools-for-teaching-critical-thinking-and-problem-solving-skills

Project-Based Learning Lesson 3: Exit Ticket

Name: _____ Date:

_____

Directions: Answer the following questions before leaving class.

1. What solution did you choose?

2. Write 2-3 sentences about why this solution is best.

Project-Based Learning Lesson 4: Graphic Organizer

Name: _____ Date:

_____

Problem Identification *(What was the problem? How did you decide? Why is it important?)*

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-
-

Problem Study *(Who did you survey? What questions did you ask? What did you find?)*

-
-
-

Solution *(What were the possible solutions? Which did you choose, and why?)*

-
-
-

Next Steps *(Who is responsible for making the change? When should the change take place? What needs to happen for your solution to become a reality?)*

-
-
-

Project-Based Learning Lesson 5: Exit Ticket[5]

Name: _____ Date: _____

Directions: Before leaving class, fill in the following 2 sentences about the problem you presented.

    (1) With regards to the problem, I used to think….

    (2) But now I think….

    (2) Adapted from Harvard University Project Zero Thinking Routines:
        http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03c_Core_routines/Core_pdfs/VT_Usedtothink.pdf