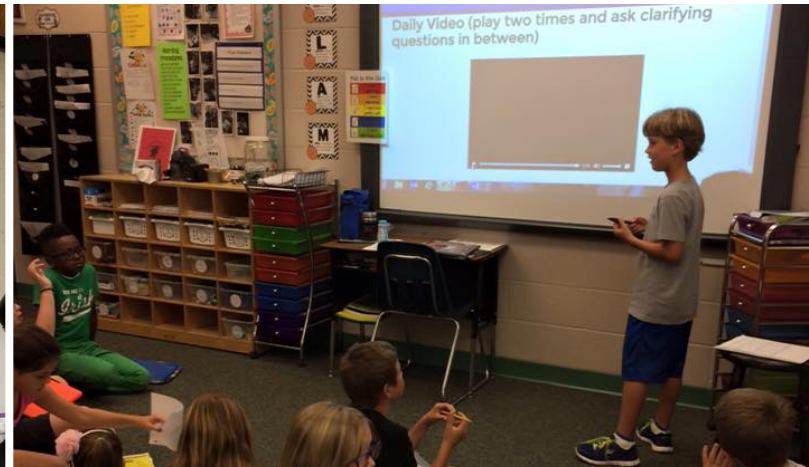
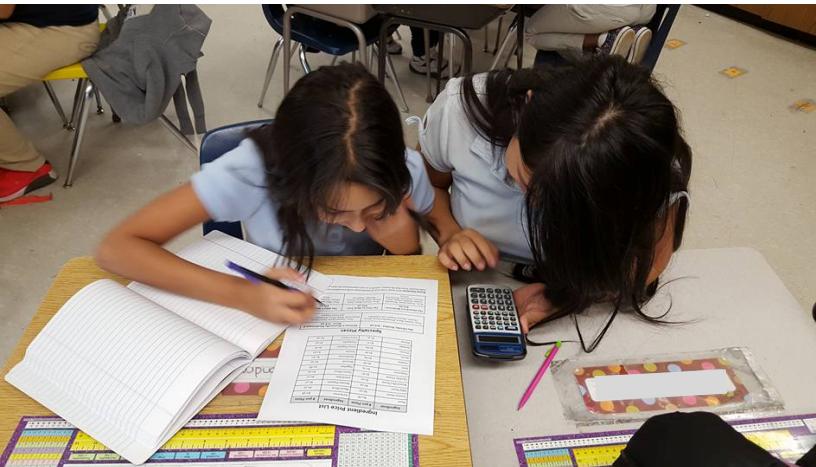


Guide to Problem Based Lessons



Front Row



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How to use a lesson in your classroom

Finding a lesson

Lessons are cross-curricular with Science and Social Studies standards

Lessons are available for grades 1–8

Free!

Addition & Subtraction Within 1,000

Passing a Bill Into Law

In this lesson, students will use the concepts of adding and subtracting within...

3rd Grade

3.NBT.2

There is a main learning objective for each lesson

Each lesson addresses one or more standard(s)

Preparing a lesson

PREP

10-15 minutes

Just print out an inquiry sheet for each of your students and review the daily presentation. That's it!

Using a lesson

Each lesson is done over 3-5 days

Each day has an objective that builds on the previous day

Lessons are designed to be completed in groups or individually

DAY 2

55-70 minutes

Students will be able to subtract within 1,000 using multiple strategies.

Individual or Group of 3-4

The lesson is designed to take the entire math block for the day

All necessary materials are provided:

- Daily presentations
- Daily video
- Inquiry sheets



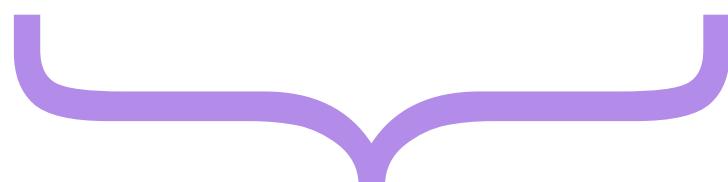
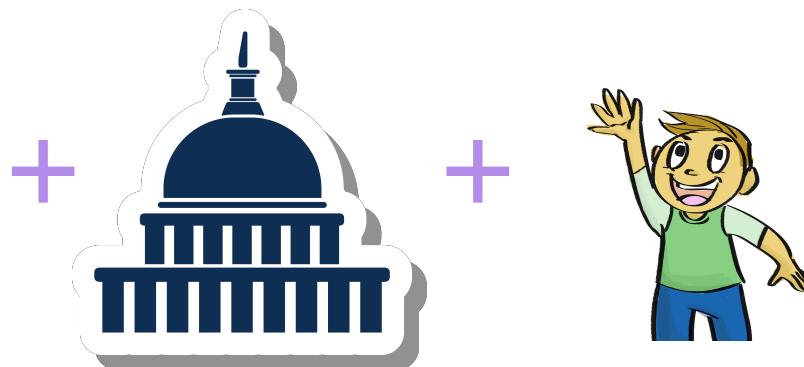
How teachers use lessons in their classroom

Teachers use Front Row's lessons to supplement not only their Math curriculum, but also Science and Social Studies curriculums.

For example, a 4th grade class is studying...

...the election process in their Social Studies unit...

...and multi-digit numbers in their Math unit.



Front Row's lesson, Campaigning for Public Office, addresses both of these subject topics.



4th Grade

Multi-Digit Numbers

Campaigning for Public Office

In this lesson, students will read, write and compare multi-digit numbers as th...

4.NBT.2

This type of cross-curricular education simultaneously deepens students' understanding of both social studies and math concepts. In addition, students gain a better picture of the world as they learn how the different subjects are connected to each other.



How lessons were developed

Front Row's Problem Based Lessons were motivated by a simple question:

What is the best way to engage students in math?

Through research, conversations with various educators, classroom visits, and constant feedback from teachers, Problem Based Lessons were created, iterated on, and perfected.

All of our 190+ Problem Based Lessons are built upon a few major principles that teachers identified as the most important for their classrooms:



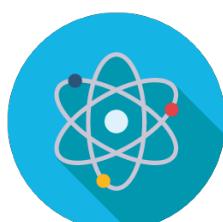
Students are never told which questions to answer, instead discovering for themselves what questions to answer and how to do so. This allows them to internalize the importance and applications of the concept being taught.



Lessons include questions that are “low floor, high ceiling”, meaning there are questions that engage students who are behind while also challenging students who are ahead.



All of the necessary materials for each lesson are provided, including daily presentations, videos, and inquiry sheets for student work. Prep time is limited to 10-15 minutes per lesson.



Lessons align with Science and Social Studies standards and other real-life situations. This builds cross-curricular knowledge for students and makes the lesson immediately relatable for students.



Walkthrough of a sample lesson

This section will look at one specific lesson, but is applicable to all lessons. Let's take a look at Passing a Bill Into Law, a 3rd grade lesson aligned with standard 3.NBT.2—Addition and Subtraction Within 1,000.

Each lesson includes an overview of what it consists of:

What does this lesson cover?

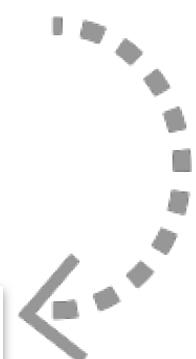
3.NBT.2 - Addition & Subtraction Within 1,000

Passing a Bill Into Law

In this lesson, students will use the concepts of adding and subtracting within 1,000 to help get a bill about littering passed into law.

After being fiercely debated by the U.S. House of Representatives, the bill goes to a vote. Students use addition to calculate whether the bill passed with a majority vote. Upon learning that the bill did not pass but can be reintroduced, students do some research on past bills that were reintroduced. When the bill finally passes the U.S. Senate and is signed into law by the President, students create a report analyzing the productivity of the last four Congresses.

DAY 1	DAY 2	DAY 3
55-70 minutes	55-70 minutes	55-70 minutes
Students will be able to add within 1,000 using multiple strategies.	Students will be able to subtract within 1,000 using multiple strategies.	Students will be able to apply their understanding of adding and subtracting within 1,000 to complete a project that resembles a real world situation.
Individual or Group of 3-4	Individual or Group of 3-4	Individual or Group of 3-4





Walkthrough of a sample lesson (cont.)

Each day of the lesson includes a presentation and Inquiry Sheet for student work:

Day 1

Objective: Students will be able to add within 1,000 using multiple strategies.

Passing a Bill Into Law

Resources

[Inquiry Sheet](#)

Day 2

Objective: Students will be able to subtract within 1,000 using multiple strategies.

Passing a Bill Into Law

Resources

[Inquiry Sheet](#)

Let's take a closer look at one of the daily presentations:

← Back to Lesson →

Passing a Bill Into Law

Addition & Subtraction Within 1,000

Day 2



Walkthrough of a sample lesson (cont.)

Presentations start with a daily review of the concepts learned the previous day:

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Daily Review

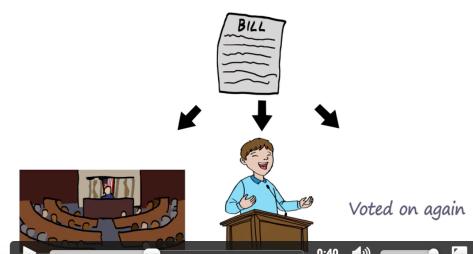
1. Solve: $89 + 64 + 137 = \underline{\hspace{2cm}}$

2. Chanelle is hosting a fundraiser to raise money for the school cheerleading team. She collects \$214 on Monday, \$99 on Tuesday, and \$333 on Wednesday. How much money has Chanelle collected so far?

Then, the daily video introduces that day's lesson:

← Back to Lesson →

Daily Video (play two times and ask clarifying questions in between)



Voted on again

0:40

Note that the video should be played twice to allow students to fully engage with the material. The provided Inquiry Sheet includes all necessary information, ensuring that students can absorb the videos without the need to write anything down.



Walkthrough of a sample lesson (cont.)

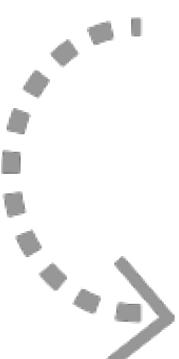
Next, there is a series of questions designed to help students discover that day's lesson:

[←](#) [Back to Lesson](#) [→](#)

What information from the video was important or interesting?

Why did these bills require a second vote?

What questions are we trying to answer in today's inquiry?



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Suggested Questions

- How many votes short of the 218 majority was each of the bills on the first vote?
- How many more votes did each of the bills receive on the second vote to be able to pass?
- Bonus: How many more votes did bill H.R.1001 receive than bill H.R.5678?



Walkthrough of a sample lesson (cont.)

Students then break into groups of 3 or 4 with the following guidelines:

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Positive Group Discussion Guidelines

- Everyone participates
- Everyone shows respect
- Everyone is focused on the task
- One person speaks at a time
- Be nice - compliment each other!



Then, one group is chosen to present while the rest of the class is encouraged to engage with the solution being presented:

[←](#) [Back to Lesson](#) [→](#)

Group Spokesperson Presents Solution

- One group will be selected to explain how they arrived at the solution and what their solution is
- After the group presents, there will be a class discussion on their answer, using the sentence starters below:
 - I agree with ____ because ____.
 - I solved it differently than ____ because ____.
 - The way that ____ explained the solution caused me to change my thinking because ____.



This portion of the daily lesson allows students to develop their presentation and critical thinking skills as they engage in productive discussion. Teacher facilitation in this part of the lesson is important to ensure all students are able to meaningfully participate.



Walkthrough of a sample lesson (cont.)

After the day's inquiry, a series of reflection questions help solidify the lesson:



← Back to Lesson →

Reflection Questions

1. Explain how you subtract multi-digit numbers from one another.
2. There are 900 pieces of popcorn in a bag. If Laila ate 246 pieces of popcorn, Erika ate 288 pieces of popcorn and Samantha ate the rest, how many pieces of popcorn did Samantha eat?
3. What was the easiest part of today's inquiry for your group? What was the most difficult part?
4. If you could start over, what would you do differently?

Finally, the presentation ends with the corresponding practice topics on Front Row:



← Back to Lesson →

Front Row Practice

1. Turn in your inquiry sheets.
2. Get your devices to work on Front Row.

Numbers in Base 10Assigned PracticeLevel 22

See a complete list of all of Front Row's Problem Based Lessons at

classroom.frontrowed.com/#lessons



Research on Project Based Learning

Based on the Buck Institute for Education's guide

Project Based Learning, the foundation of Front Row's lessons, has been proved to be effective for student achievement. This style of learning increases student engagement in their education and deepens their understanding of academic content. In particular, Project Based Learning improves:

Academic mastery:

It is important for students to not only learn academic content, but to be able to apply what they have learned in new contexts. Project Based Learning has been shown to:

- Help students remember content and have a deeper understanding of concepts they have learned (Penuel & Means, 2000; Stepien, Gallagher, & Workman, 1993)
- More effectively teach math, economics, language, science, and other disciplines than traditional methods in specific content areas (Beckett & Miller, 2006; Boaler, 2002; Finkelstein et al., 2010; Greier et al., 2008; Mergendoller, Maxwell, & Bellismo, 2006)
- Result in higher performance on high-stakes tests (Parker et al., 2011)

Preparation for college and careers:

When students are looking to develop crucial skills for college and beyond, Project Based Learning helps them:

- Develop problem-solving skills that they are better able to apply to real-world situations (Finkelstein et al., 2010)
- Increase their critical thinking skills (Beckett & Miller, 2006; Horan, Lavaroni, & Beldon, 1996; Mergendoller, Maxwell, & Bellismo, 2006; Tretten & Zachariou, 1995)
- Learn to work collaboratively and effectively in a team (Beckett & Miller, 2008)
- Regardless of grade and achievement level across multiple subjects through opportunities for collaborative learning (Johnson & Johnson, 2009; Slavin, 1996)



Research on Project Based Learning (cont.)

Based on the Buck Institute for Education's guide

Creating an even playing field:

Education should equip each student with the tools they need to succeed, regardless of their background. Project Based Learning does this by:

- Engaging all students, especially those who are lower-achieving (Boaler, 2002; Penuel & Means, 2000)
- Being flexible enough to be applied effectively in different types of schools and for different types of learners (Hixson, Ravitz, & Whisman, 2012)
- Providing a potential model for whole-school reform (National Clearinghouse for Comprehensive School Reform, 2004; Newmann & Whilage, 1995; Ravitz, 2008)

Student motivation:

It is crucial for students to feel connected to their education and take charge of what they are learning. Project Based Learning has been shown to:

- Engage students and make them more self-reliant while also improving their attendance (Thomas, 2000; Walker & Leary, 2009)

Teacher satisfaction:

Teachers are the experts in their classroom, and any effective education method should make their lives easier. Project Based Learning helps:

- Improve teacher job satisfaction (Hixon, Ravitz, & Whisman, 2012; Strobel & van Barneveld, 2009)

For the full texts and more information about Project Based Learning, visit the Buck Institute for Education's website at bie.org.



Create a FREE account with Front Row at

classroom.frontrowed.com