

Stress Free Approach to Science and Mathematics

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Introduction to CTL

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Center for Teaching and Learning (CTL)

The NJ Center for Teaching and Learning (CTL) is a Nonprofit founded by the NJ Education Association to **empower Teachers to lead school change**.

CTL is supported by NEA, NJEA, and other leaders in education, business, and philanthropy.



Center for Teaching and Learning (CTL)

Science and mathematics are becoming priorities to states and countries for reasons of

Social Justice
AND
International Competitiveness

Center for Teaching and Learning (CTL)

Social Justice requires that we provide all students fair access to math and science.

Global Competitiveness requires the same; societies prosper by realizing the capacity of their people.

PSI-PMI

The Progressive Science Initiative (PSI) & Progressive Mathematics Initiative (PMI) are CTL's main programs.

PSI-PMI provide a new technology-enabled efficient system that results in student learning and engagement, as well as teacher satisfaction and increased effectiveness.

PSI

K-8 Science
Aligned to NGSS

9th-grade Physics
10th-grade Chemistry
11th-grade Biology
Aligned to AP

PMI

K-8 Math, Algebra I, Algebra II, Geometry
Aligned to Common Core

Pre-Calc & AP Calculus
Aligned to AP

PSI-PMI

Founding course PSI Algebra-Based 9th-grade Physics



PSI-PMI

The curriculum design supports best practices:

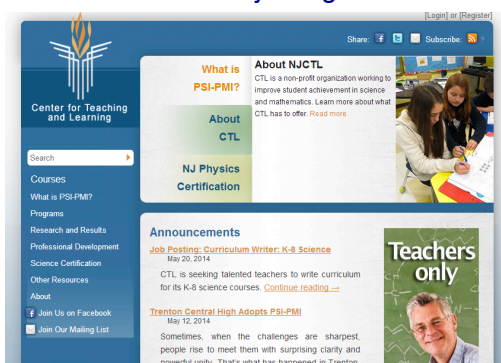


- Short, Direct Instruction
- Social Constructivism
- Formative Assessment
- Guided Inquiry Labs
- Rigorous, Aligned Summative Assessments

Created by Teachers, for Teachers

Tour of the Website

www.njctl.org



PSI-PMI Pedagogy

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Pedagogy

PSI-PMI materials have been designed to support a pedagogy that combines:

Direct Instruction

Social Constructivism

Both of these parts are used in conjunction and are tied together through the use of formative assessment.

Direct Instruction

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The Role of Direct Instruction

Teachers can and should directly explain concepts and ideas to students at appropriate times.

However, the student must be engaged in problem solving and the instructional help must be at the appropriate level.

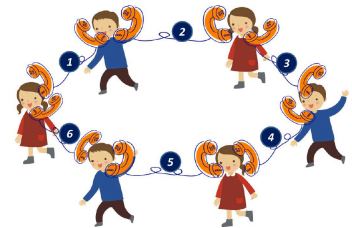
The educator assists learning through demonstrations, leading questions, modeling, and introducing initial, critical elements of a task.

The learner transforms the help they receive and uses the same means to direct independent problem solving behaviors.

Goal of Direct Instruction





Students obtain a foundation or constructing knowledge. Some kids get it right away, other kids need to hear it again, in another way, or from their friend instead of the teacher.

The students will then use this foundation to shift from direct instruction to social constructivism.



5th Grade Decimal Addition

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Teacher Notes	 Ones		 Tenths	 Hundredths

Clip art by Scrappin Doodles license 56424, <http://www.scrappindoodles.com> ©2012 Donna Boucher

A place value chart can be used to make subtraction easier.
 You will use your base-10 manipulatives to work out this problem.

1 whole
1 tenth
1 hundredth

Teacher Notes

Ones	Tenths	Hundredths

Click! + Click! = Click!

Click to check.

On our paper, we can draw squares to represent 1 whole, lines to represent tenths, and small circles to represent hundredths.

Ones	Tenths	Hundredths
		o
+		o o o
		o o o

0.21 + 1.04 = 1.25

0.57 + .04 = ?
 What should we do with all of the ones?

Ones	Tenths	Hundredths
		o o o o
+		o o o
		o

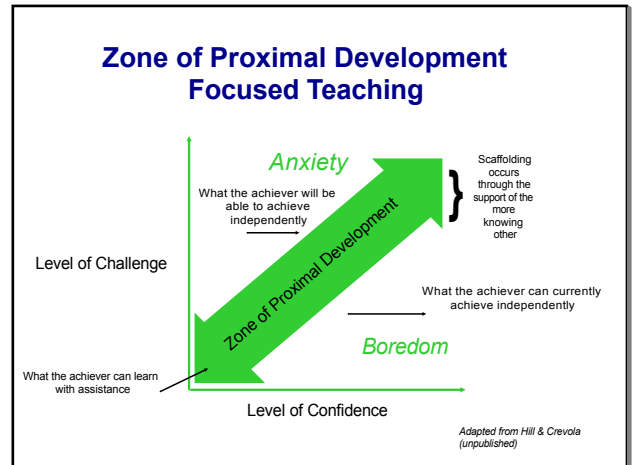
7 + 4 = 11,
 Circle the group of 10.
 There is 1 tenth and 1 hundredth.

0.57 + .04 = 0.61

Click to check.

Social Constructivism

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Pedagogy: Formative Assessment

Frequent Formative Assessment provides:

- Active engagement** for students
- Evidence** of where students are in the learning progression
- Feedback** that feeds forward
- Feedback** that helps students identify their own strengths & weaknesses during a lesson
- Feedback** that is ungraded

Getting started with the SMART Response or BYOD

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SMART Response

PE Responders



VE Response



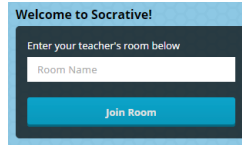
XE Responders



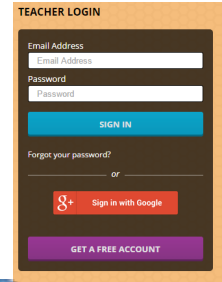
for a BYOD atmosphere

Free Resources

There are also free resources on the web. As long as students have access to the Internet on a device, they can use these free resources like Socrative.



[/b.socrative.com/login/student/](http://b.socrative.com/login/student/)



[/b.socrative.com/login/teacher/](http://b.socrative.com/login/teacher/)

Why use a response question?

Responders or BYOD are good for kids! They allow them to:

- Participate individually
- Answer anonymously
- Constantly evaluate what he/she knows and can do
- Focus and remain engaged

Why use a response question?

Responders or BYOD apps are good for teachers! They allow them to:

- Get feedback from the entire class at once
- Shift the class to student-centered participation
- Gather real-time data that informs their teaching
- Ask questions that get increasingly difficult, so that students remain challenged, but can work with peers to "win"

Based on student answers the teacher can:

**reteach
review
or move on**

VE Response

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SMART Response - VE (BYOD option w/ SMART) Student Sign In

When the Instructor **starts a question**, a prompt automatically appears like the one below instructing students to go to response.smarttech.com

Students need the following information to connect:

Website:
response.smarttech.com


Assessment ID:
092012
(Sample) QR Code | OK



(Sample)

Student Sign In

Once on the website, enter the Assessment ID.
This will be a unique number each time a class is started.
Then select "Sign In".
In anonymous mode, no need to enter Student ID.



Response VE

Assessment ID:

Student ID:

1 It is easy to sign in to SMART response VE.

True Select answer

False

1 of 1 Sign Out

1 It is easy to sign-in to SMART response VE.

True

False

← [Question List](#) →

Select right arrow

Question List

1. It is easy to sign-in to SMART response VE.
True

Select submit

2 Enter the number for the month you were born.

Type in a number
Select right arrow
Select Submit

1 of 1

Enter your answer:

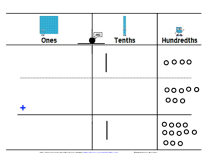
← [Question List](#) →

3 Enter the number for the month you were born.


Type in a number
Hit the right arrow

3 Which place value model correctly represents $0.14 + 0.08$?

A

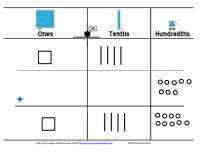


B

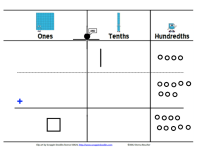


Answer



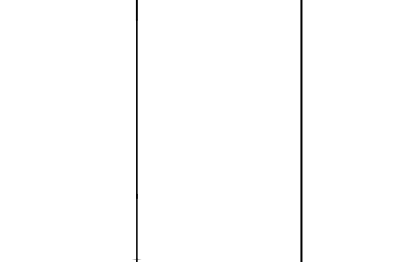
C



D





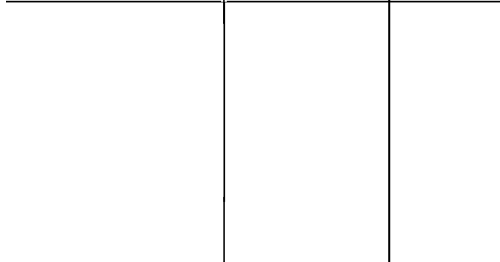
4 Use the place value chart to model the following problem. What is the answer?
 $0.05 + 0.71 = ?$

Ones	Tenths	Hundredths
 0.05	 0.71	
 0.76		

Answer

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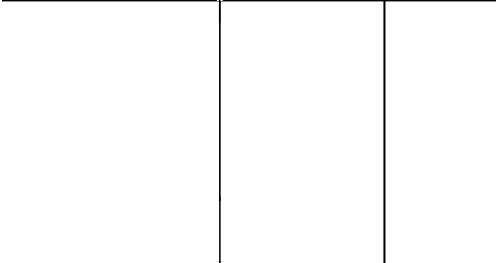
5 Use the place value chart to model the following problem. What is the answer?
 $2.35 + 0.17 = ?$

Ones	Tenths	Hundredths
 2.35	 0.17	
 2.52		

Answer

Clip art by Scrappin Doodles license 55424, <http://www.scrappindoodles.com> ©2012 Donna Boucker

6 Use the place value chart to model the following problem. What is the answer?
 $0.65 + 1.8 = ?$

Ones	Tenths	Hundredths
 0.65	 1.80	
 2.45		

Answer

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7 Solve, then write your answer in standard form. Draw and use a place value chart to help you.
 1 tenth + 1 and 2 tenths = _____

Answer

8 Solve, then write your answer in standard form. Draw and use a place value chart to help you.
 35 thousandths + 8 thousandths = _____

Answer

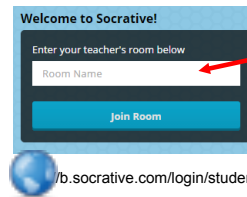
9 Solve, then write your answer in standard form. Draw and use a place value chart to help you.
 6 thousandths + 9 ones 5 thousandths = _____

Answer

**Socrative.com
Responders**

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Response
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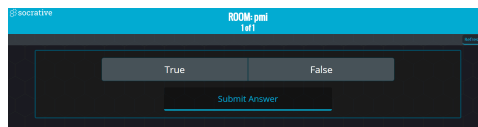
Students Join Class



Our room name is:
LR6XCTGE

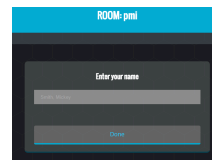
10 I need an Internet connection to use Socrative.com

**True
False**

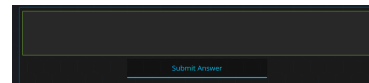


Click either True or False.
Then Click Submit.

11 Enter the number for the month you were born.



First type in your name.
(Teacher can either require
this or not.)



Type answer in the
box and hit submit.

12 What grade do you teach?

13 This glass is ...

- A Half empty
- B Half full
- C Completely full
- D Other



Choose the correct letter on your screen and click submit.

14 Which foods do you like? (You can pick more than one.)

- A Pizza
- B Pasta
- C Guacamole
- D Sushi
- E Cake

15 What is the fraction for 0.5?

Use the / key to make a fraction.

16 Are there any questions about how to use the responders?

Yes

No

17 How much experience do you have using SMART notebook?

A I am an expert and create my own SMART notebooks for instruction.

B I use SMART notebook occasionally, am familiar with the toolbars, galleries, etc.

C I have a little bit of experience with SMART notebook.

D I have never used SMART notebook.

18 How much experience do you have using a SMART board?

A I could be a SMART certified trainer. I use a SMART board every day.

B I have used a SMART board and am comfortable with it.

C I know how to turn a SMART board on and that is about it.

D I have never used a SMART board.

Grading and Collaboration

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What do we grade?

Only summative assessment tasks are graded:
quizzes, tests, quests, and labs .

There are no grade points awarded for:
participation, attendance, class work, or homework.

There is no extra credit work.



Why only grade summative assessment?

By only grading summative assessment tasks, we are grading that work which shows each student's independent demonstration of their knowledge, application, and understanding.

This creates an objective grade increasing the correlation of the student's grade with the end of course test.

This also allows the grades of students to be compared from teacher to teacher and from school to school.

Retakes

Students are allowed to retake all quizzes and tests.

Retakes of all assessments are provided on our website (www.njctl.org)

Students can retake an assessment as many times as necessary, however most students only need one retake and only one retake is posted on the website.

The highest grade earned replaces the lower grade. The grades are not averaged together.

Once graded, return to students for them to see their grade, however students should not keep these retakes.

Why do we give retakes?

Retakes encourage persistence

Retakes keep students motivated to learn

Retakes reflects the real-world view of failure as feedback to inform future decisions

**If your child doesn't know how to tie his shoe, are you going to just give him extra credit or tell him to continue to practice?*



K-12 Common Core Aligned Math

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Common Materials

All PSI & PMI materials were developed through SMART lesson study.

In this manner the materials were developed by groups of teachers working together to continually improve upon the existing materials and provide the best product possible.

When students move from one grade level to the next, the teachers have common materials to refer to and the ability to discuss the measurable progress the students have made.

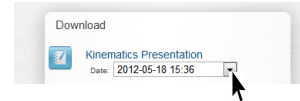
Teachers can focus on the HOW of teaching, not the WHAT to teach.

Let's Tour Some Units!

Latest Versions of Materials

Since PSI-PMI materials are continuously improved and updated, newer versions of existing files are constantly posted on the website.

The newest version will appear posted first with the date next to it. Older versions may still be accessed.



Select dropdown to access older versions

Suggestions for Improvement

Your feedback is essential!

[Open discussion in new window.](#)

Feedback [Feedback](#) > Overview

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Enter your idea and we'll find it or add it

Fine product of
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