Microsoft

TEALS Program

Building equitable, inclusive computer science programs in schools

Teaching Team

Reference Guide

TEALS Mission

The Microsoft Philanthropies TEALS (Technology Education and Learning Support) Program aims to build sustainable computer science programs in high schools, with a focus on serving students historically excluded from technology.

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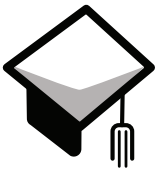
Pedagogical Basics

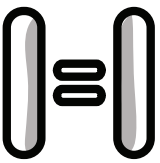
Roles & Responsibilities - Teacher

Lead



Learn

Instruct



Relate

Communicate

Assess

Manage the classroom

Roles & Responsibilities - Regional Manager

- Prepare teachers and volunteers for the school year
- Observe volunteers in class and offer feedback
- Communicate action items for teaching teams throughout the year
- Offer ongoing support for the teaching team

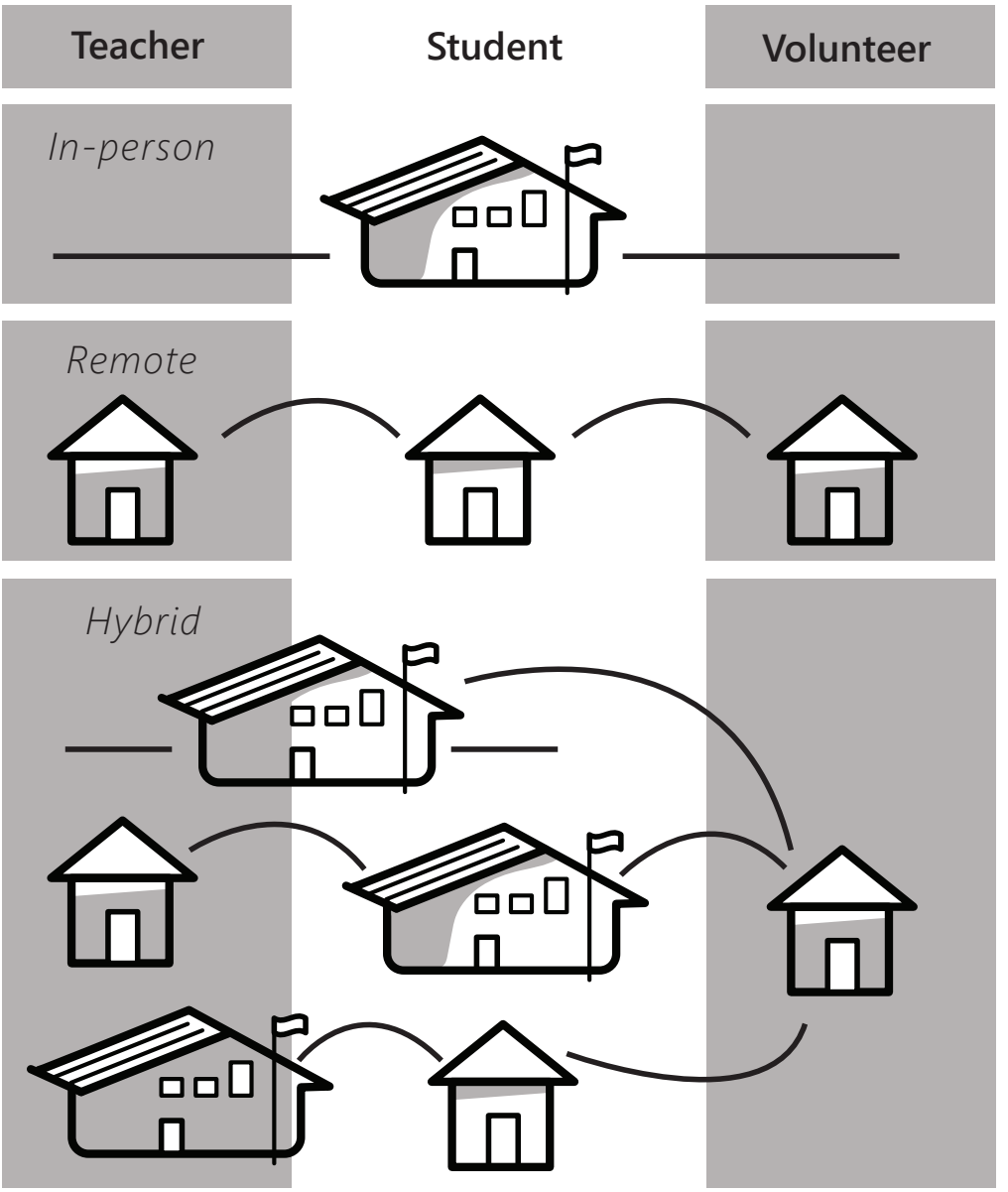
Roles & Responsibilities - Volunteer

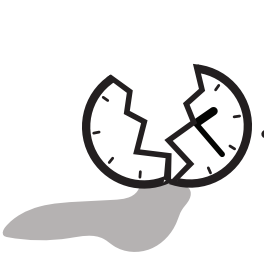
Volunteers support the teacher and the classroom, while serving as a model for the students.

- Help plan lessons
- Regularly sync
- Give real world CS examples and opportunities
- Build relationships and inspire students
- Provide content knowledge feedback
- Grade projects and assignments

Support Scenarios

Education can happen from a combination of locations.

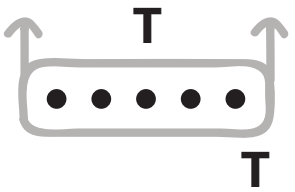




Volunteers can also contribute resources and feedback **asynchronously**, outside of the regular class period.

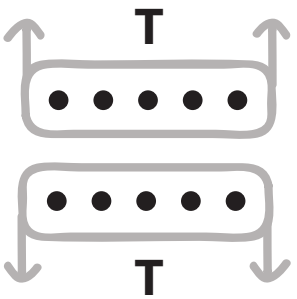
Co-Teaching Configurations

Which format is most useful for today's lesson?

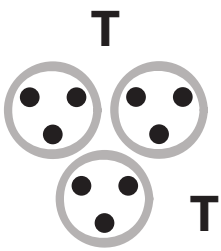


One Teach, One Support

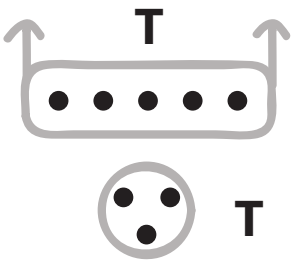
Team Teaching



Parallel Teaching



Station Teaching



Alternative Teaching

https://aka.ms/tealscoteaching

The Habits of Highly-Effective Volunteers

During Instruction

- Determine which students will need the most help
- Check who turned in assignments
- Work with previously-absent students
- Interject with alternative explanations or personal anecdotes

During Lab

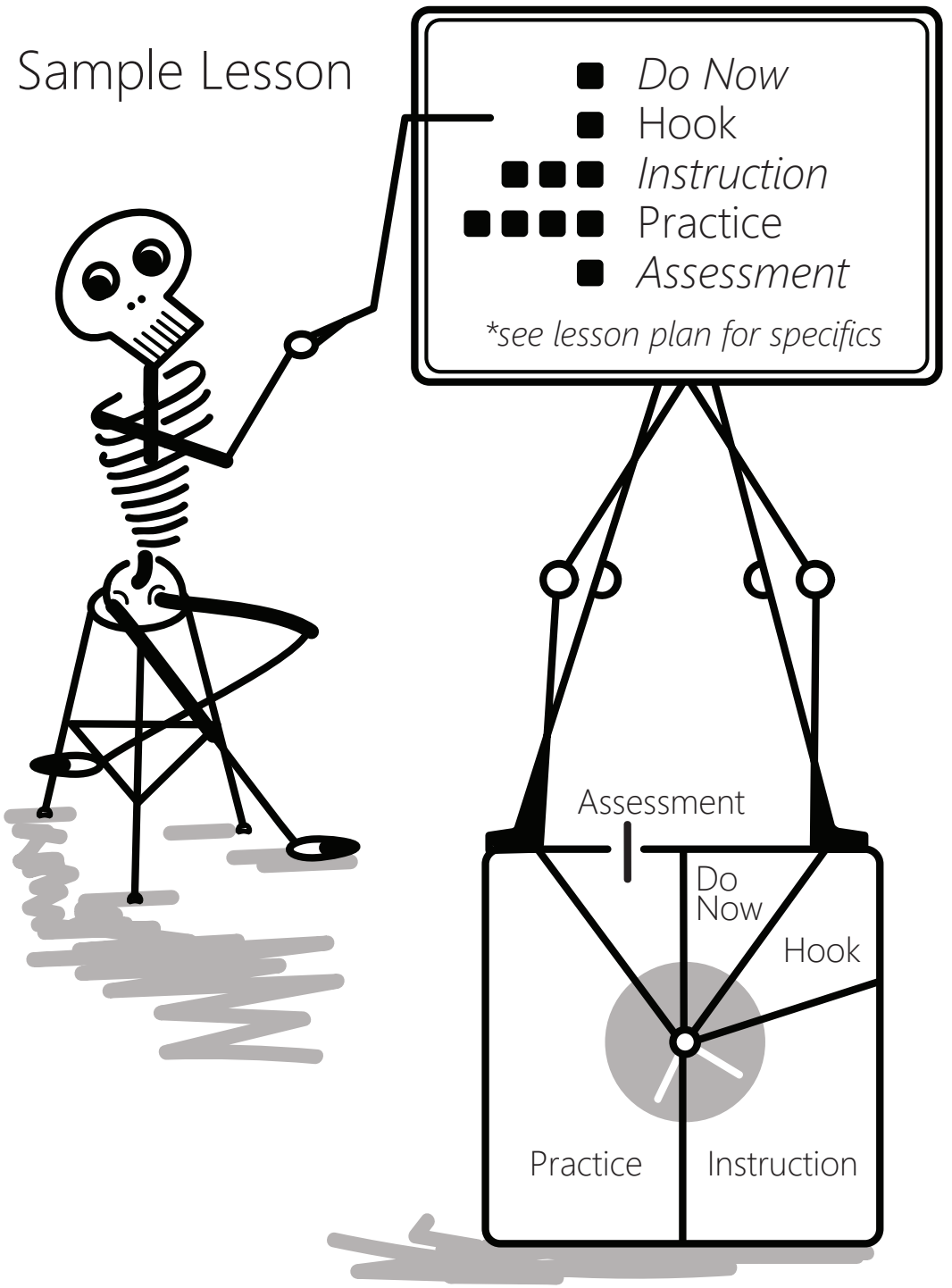
- Provide differentiated instruction to students who need individual attention
- Lead a review session on a tricky topic

Outside of Class Time

- Create additional *formative assessments*
- Help with provide feedback on student work
- Help classroom teacher learn material
- Add additional examples and industry relevance to lessons

Anatomy of a Lesson

Sample Lesson

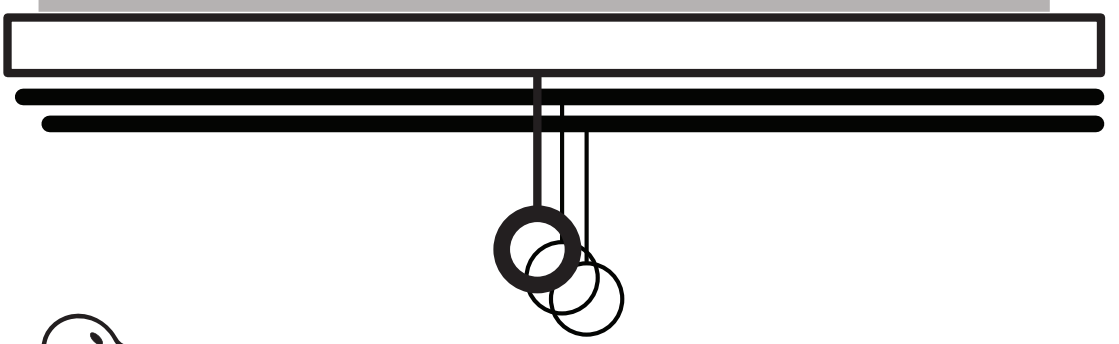


https://aka.ms/tealsanatomy

Do Now / Warm Up

A quick start-of-class focusing activity that may assess student progress, review recent content, or foreshadow the day's lesson

- ○ A problem related to previous lesson
- ○ Review HW with a peer
- ○ A challenge that will be explained by today's lesson



5 Minutes of every class period!

https://aka.ms/tealsdonow

Hook

A lead-in to the day's lesson designed to pique students' interest and curiosity


Questions


Puzzles


Video


Demo


Photos


Current Event

```
1  if (x = 12)
```

Challenge w/ sample code: what's wrong?

Relate to students' interests or they'll never hear you.

5 Minutes of every class period!

https://aka.ms/tealshook

Instruction & Practice

(25% of class)

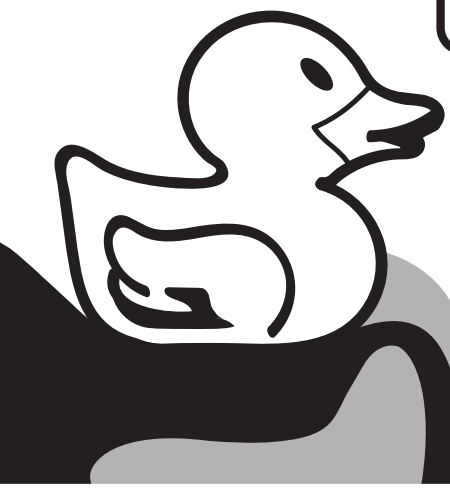
Explanations
Definitions
Walkthrough
Research
Worked Example
Demonstration

(75% of class)

Labs
Projects
Worksheets
Textbook problems
Creating presentations

Roleplaying | CS Unplugged Activity | Discussions

+1 Go beyond lecture with *active learning strategies*



https://aka.ms/tealsinstruction

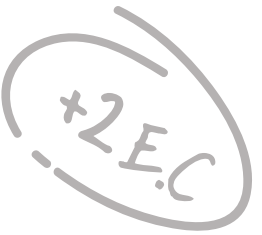
Assessments

Formative Assessments

A quiz provides a chance for students to demonstrate their knowledge, while a project checkpoint leaves room for feedback and redirection.

A lab is a great in-class option for participation and group-learning.

A worksheet is similar to a quiz and individual or group questioning is the quickest way to dialogue with students.



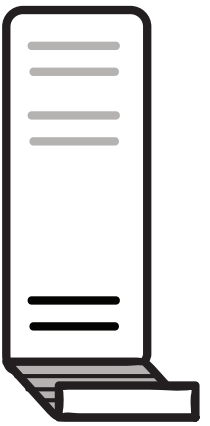
Summative Assessments

A project or test allows students to demonstrate what they learned at the end of a unit.

Before Class Checklist

- [ ] Arrive early

- [ ] Ensure that **Learning Objectives** are visible to students in classroom



- [ ] Share the **Do Now**
- [ ] Re-read the lesson plan

- [ ] Power up all machines

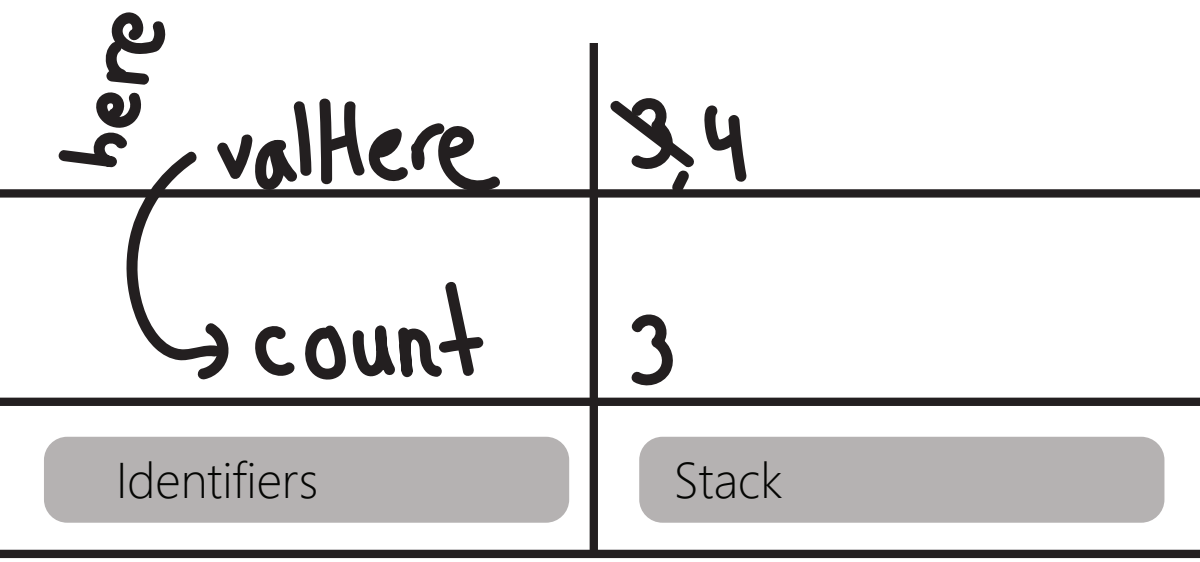
- [ ] Have a **Hook**

Worked Examples

Methods/Functions

```
1 >     def here(valHere)
2 >         valHere = valHere + 1
3 >         return valHere

4 >     count = 3
5 >     count = here(count)
```



Ithaca-Style Memory Diagrams
are useful for visualizing the internal state
of a computer while tracing.

Great for worked examples in class!

https://aka.ms/tealsworked

Building Problem Solving Skills

Subgoal Labeling:

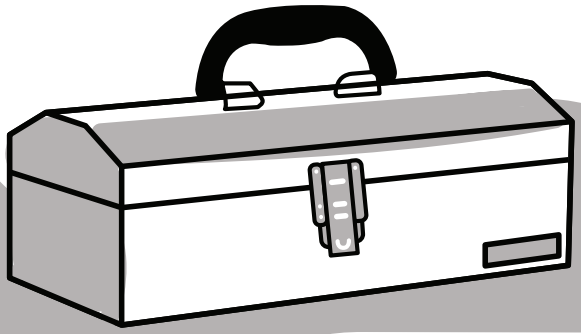
When you give a *short*, *clear label* to each part of your program to illustrate what it does. You can incorporate this into labs, starter code, and sample solutions.

Debugging strategies to teach students:

Rubber duck

Print statements

Isolating the bug and/or simplifying code



Classroom Procedures

Classroom procedures help your class run smoother with little waste of time

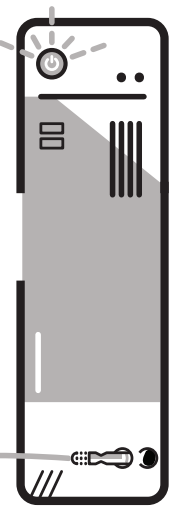
- Create new ones opportunistically
- Optimize for efficiency
- Plan to teach and rehearse them

Example Procedure

At Start of Class

1. Pick up headphones

2. Be seated before the bell rings and turn on your computer



3. 

Log-in and open today's lesson.

4. Turn on your camera and microphone.
Plug in headphones.

5. Log-in.


PracticeIt

or

Snap!

or


Eclipse

6. Create a new project.

w/ TEALS Volunteer

7. Complete the Do Now Activity

8. Turn the Green Cup upside-down on desk. Show you're ready to learn.

Encouraging Productive Discussions

Take turns
being the first one to talk

Take turns
presenting ideas

Do not dominate
the conversation

Think about alternative
ways to solve the problem

Ask for clarification

Even if your group-mate has said something very clearly and correctly, it's a good idea to repeat it yourself

Differentiated Instruction

Help *all students* grow and learn in your classroom

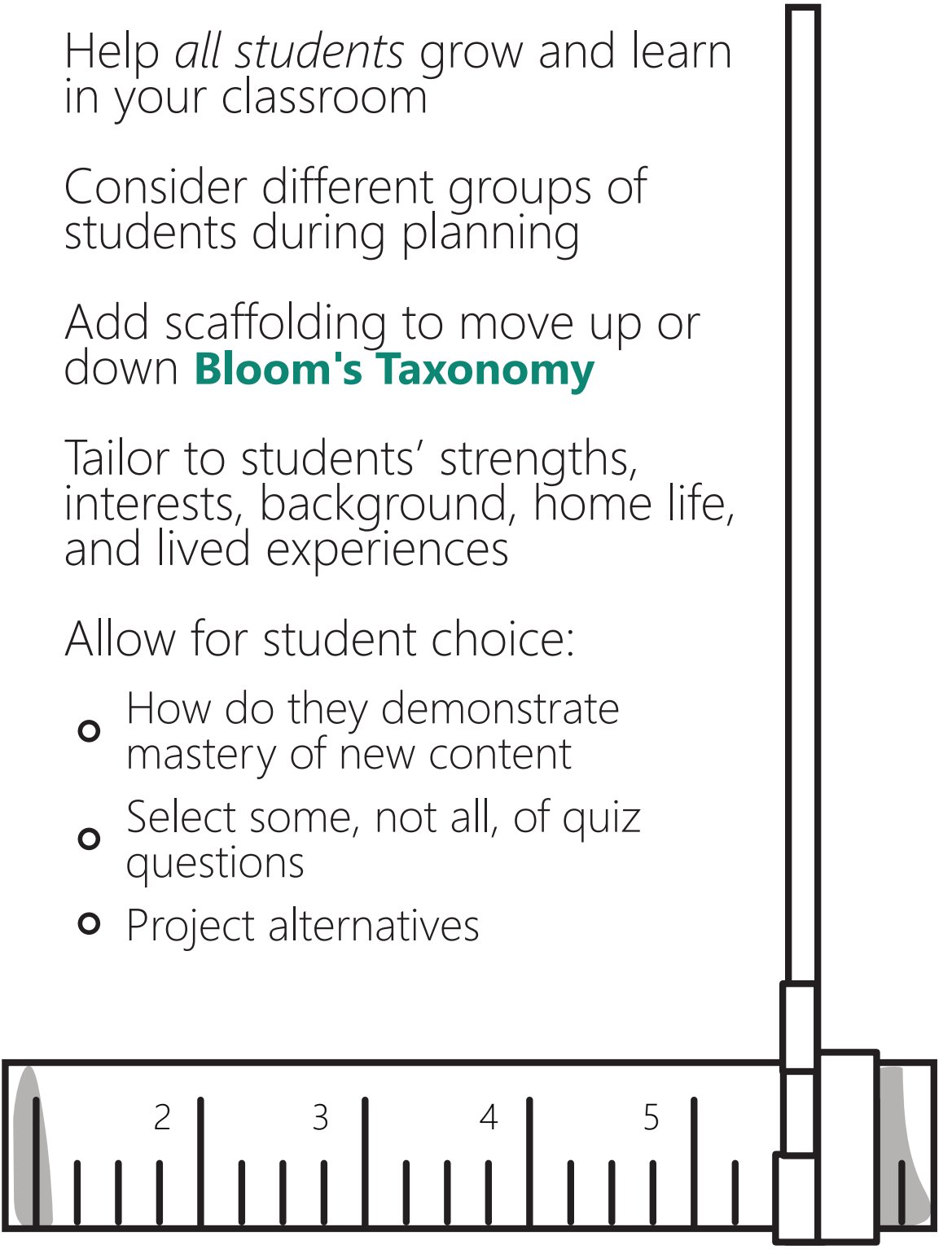
Consider different groups of students during planning

Add scaffolding to move up or down **Bloom's Taxonomy**

Tailor to students' strengths, interests, background, home life, and lived experiences

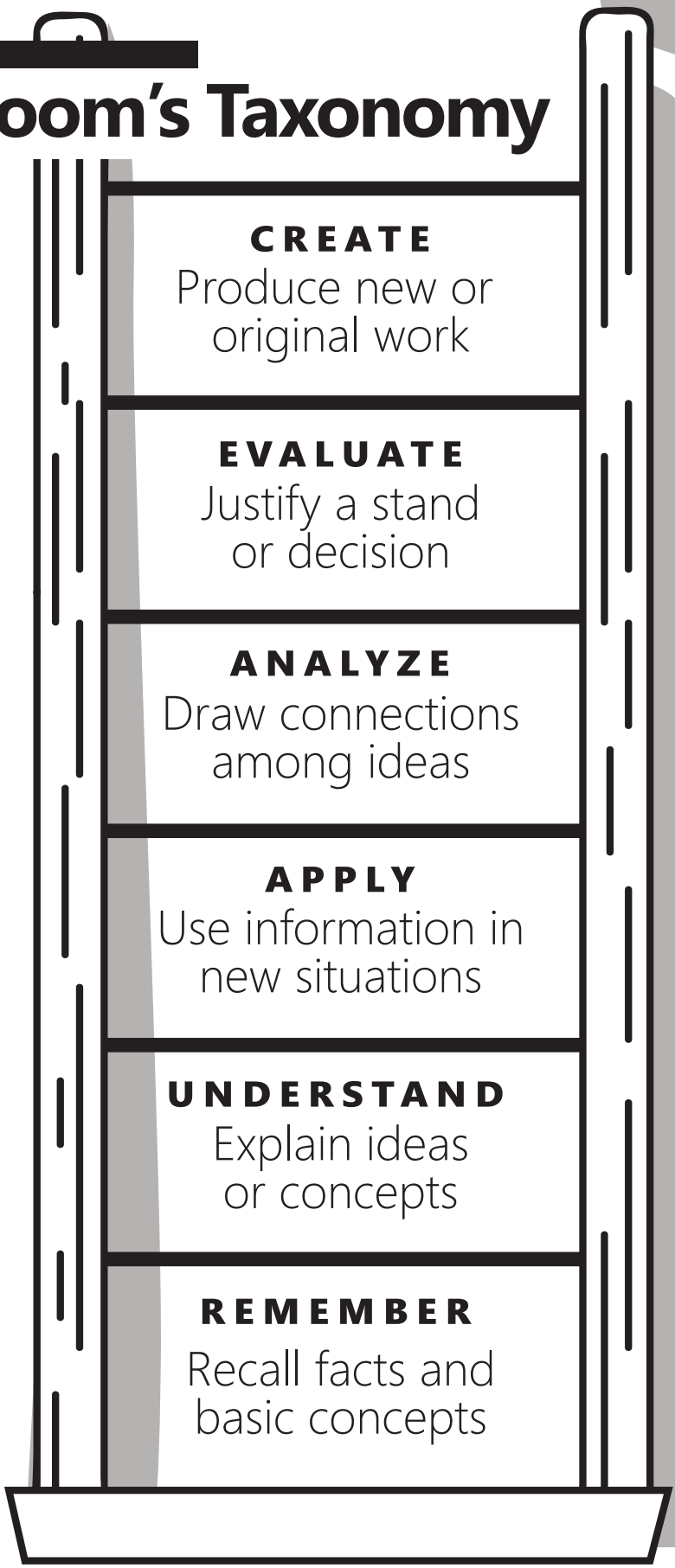
Allow for student choice:

- How do they demonstrate mastery of new content
- Select some, not all, of quiz questions
- Project alternatives



https://aka.ms/tealsdifferentiated

Bloom's Taxonomy

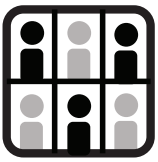


https://aka.ms/tealsblooms

Getting to Know the Students

Learn and use student names

- Name placards
- Seating charts
- Mnemonics

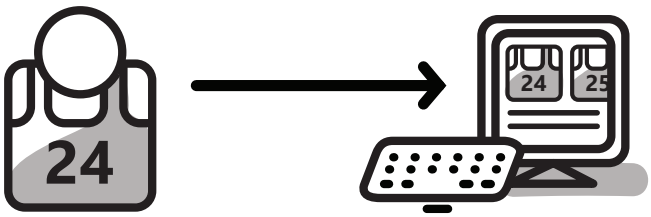


Insist students use your name

Learn about students' interests

- Student experiences survey
- Chat before or after class
- Attend school and community events

Incorporate student interests into examples and assignments



https://aka.ms/tealsknowstudents

Wise Feedback

Set high expectations

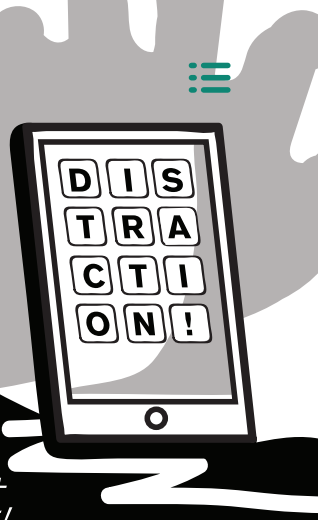
Give personal assurance

Provide an *actionable next step*

(Try Socratic Questioning)

https://aka.ms/tealsencouragement

Re-engaging with Distracted Students



***Avoid escalation**. When in doubt, get help from the classroom teacher.*

Use body language and cues, for instance: 'I clap once for attention.'

Walk closer to student

Remote Option - Join a Breakout Room

Use competitions

Give students a job to do

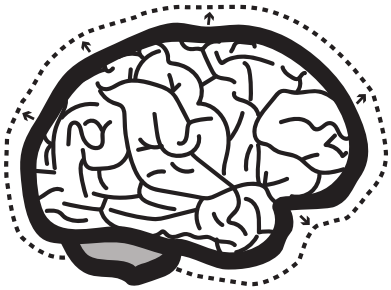
Break up activities into chunks

Use incentives like public or private encouragement, stickers, etc.

Re-evaluate pacing of the lesson or lab

https://aka.ms/tealsdistracted

Dealing with Failure/ Growth Mindset



Growth Mindset

Abilities can be acquired through study and effort.

Explain the growth mindset to the class and reference it often

Share your experiences with *failure*.

https://aka.ms/tealsgrowth

Diversity, Equity & Inclusion

Diversity, equity, and inclusion (DEI) are core tenets of the TEALS program.

While any secondary education school can partner with TEALS, the program focuses on supporting historically underserved populations (by race, gender, geography, accessibility and political or other social challenge).

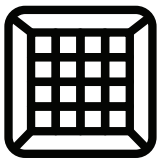
TEALS asks schools to commit to taking action in three categories:

- Diversity in Enrollment
- Inclusive Learning Space
- Inclusive Instruction

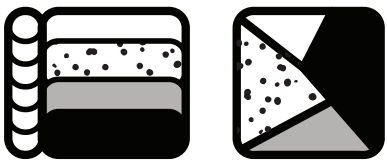
SIGN HERE

Diversity in Enrollment

Cast a broad net to appeal to all students



Aim for your CS roster to match the demographic makeup of the student body



Advocate with guidance counselors and administrators for building an inclusive CS class

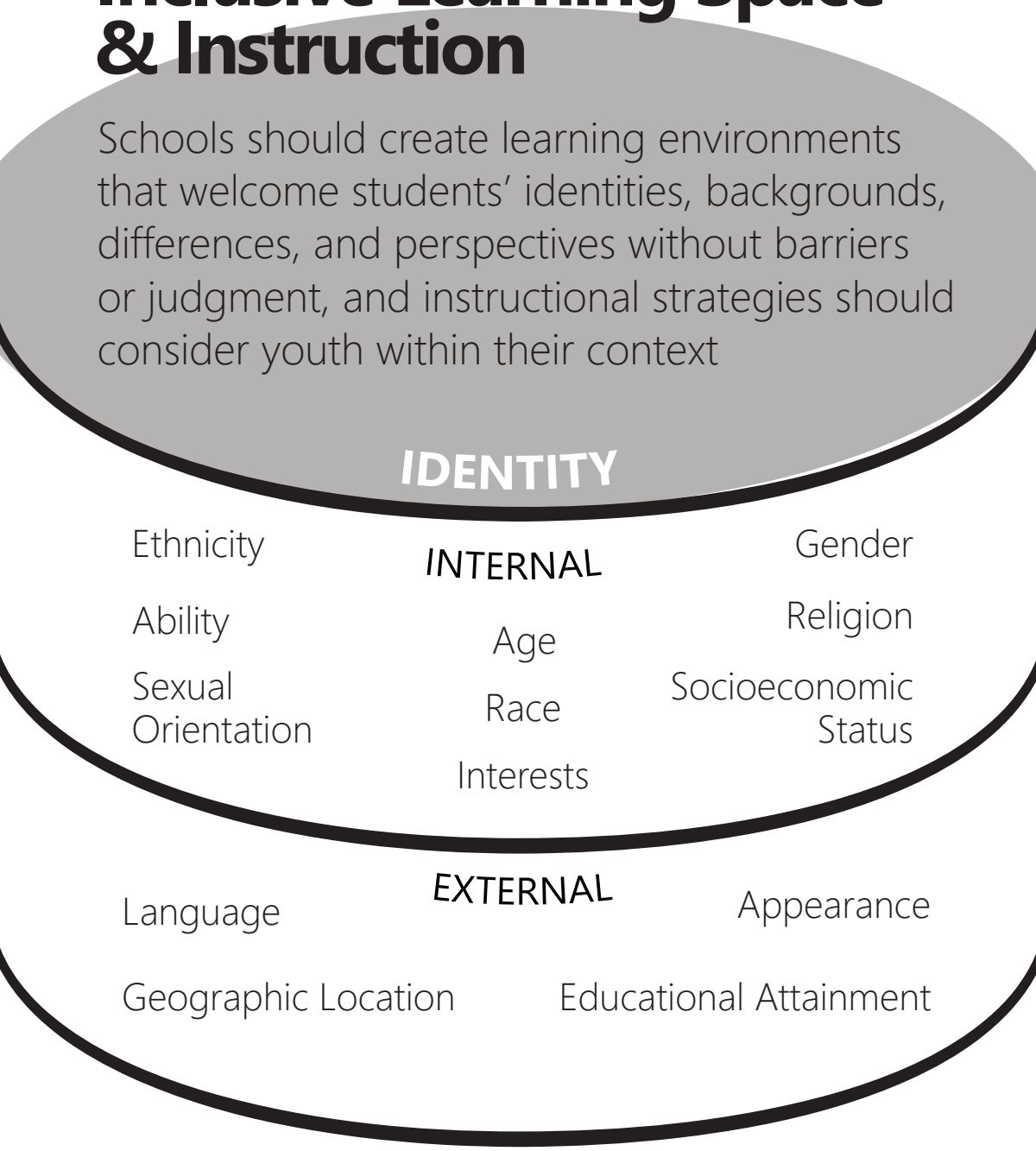
Click or visit this address for our extensive ***Guide To Enrolling Diverse Students***

It can help!

https://aka.ms/tealsdiversestudents

Inclusive Learning Space & Instruction

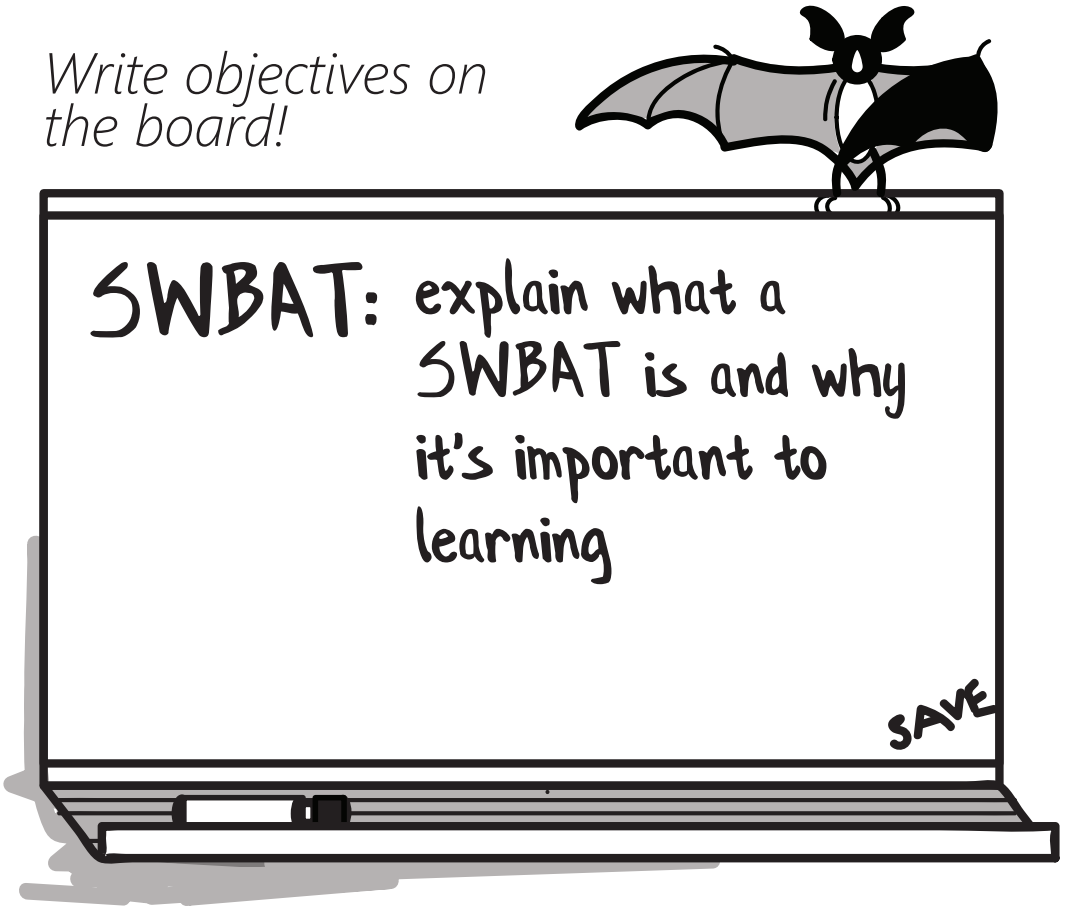
Schools should create learning environments that welcome students' identities, backgrounds, differences, and perspectives without barriers or judgment, and instructional strategies should consider youth within their context



https://aka.ms/tealsdiversity

Learning Objectives

Write objectives on the board!



What is SWBAT?

SWBAT stands for "Students Will Be Able To"—a short student-centered learning objective that implies a method of assessment.

https://aka.ms/tealslearningobjectives

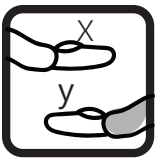
Active Learning Strategies

"What matters is not what the teacher teaches but what the student learns."

Try the formats below to keep students engaged in the learning process.


Discussion

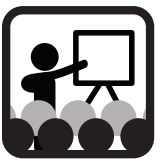

Tutorial



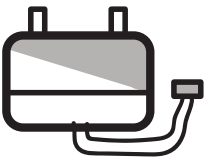
Debate

Roleplay


Worked example


Student presentations


Game

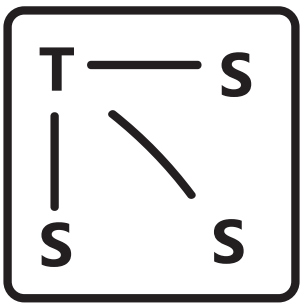

Unplugged activity

https://aka.ms/tealsstudentcentered

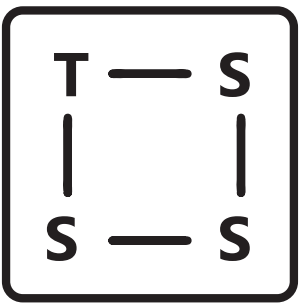
Questioning Techniques

Look, a silent room is no fun, but kids don't always want to be called on. Create an interactive classroom where everyone participates.

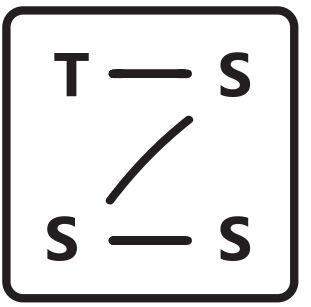
A Playbook to Keep it Moving



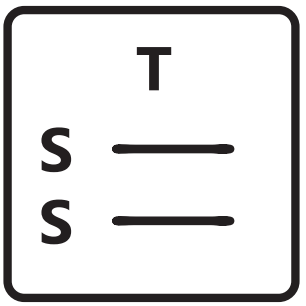
Cold calling (with warning)



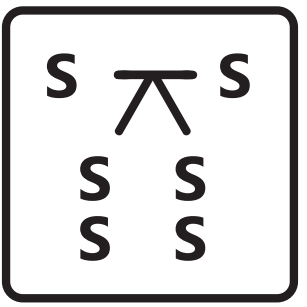
Around the World



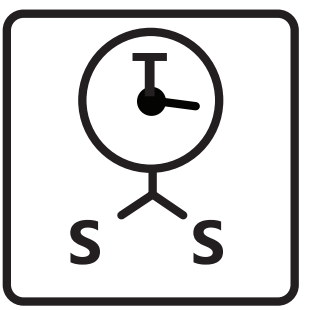
Popcorn



Everyone Writes



Think Pair Share



Wait Time

T You **S** Student — The Question

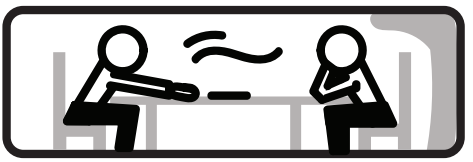
https://aka.ms/tealsquestioning

Students Seeking Help

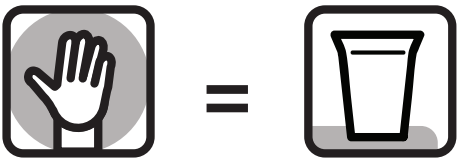
Look up in notebook

Look at previous code

```
1  for (int i = 0; i < 10; i++)
```



Ask another student for help



Cup right-side-up for help

A green cup means *no problems*; a yellow cup means *need help but still working on other things*; and a red cup means *totally stuck*.

Make a queue of student names

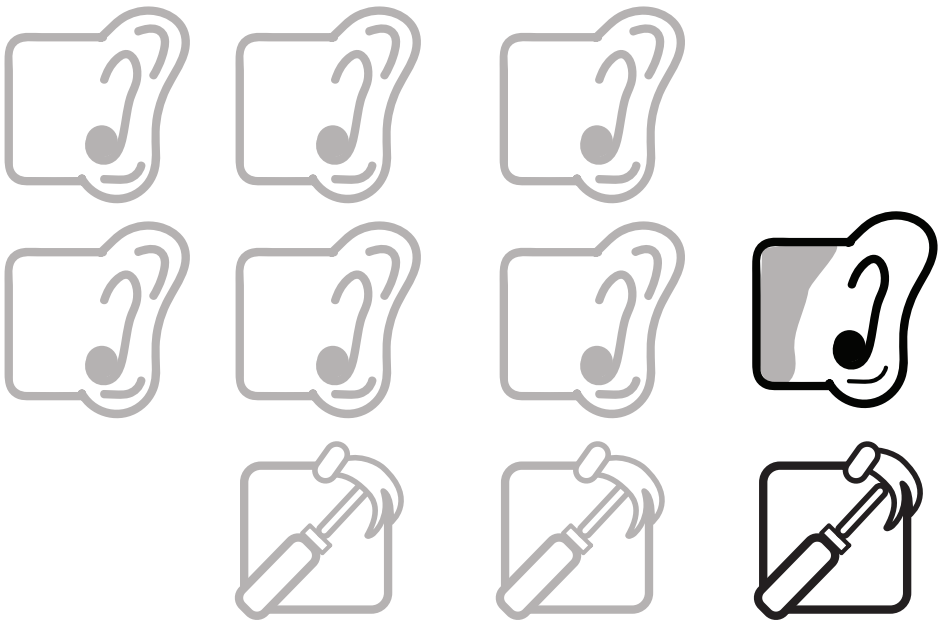
If multiple students have the same questions:

- Reteach entire class or
- Create a breakout group to reteach

https://aka.ms/tealsstudenthelp

Repetition

Students need to hear things 7 times or do them 3 times before they are added to long-term memory!



*How to repeat a **topic** without repeating **yourself***

(1) - Present **topic**

(2) - Students independently research **topic**

(3) - Students do group project on **topic**

(4) - Students study for test on **topic**

Notebooks/Journaling

Studies show hand-written notes are an important part of active learning

Part of classroom procedures to take out notebook

Tell students to write important concepts in notebook

Ask students to look up answer in notebooks

Notebook checks once a week

Hand out notebook stickers for job well done

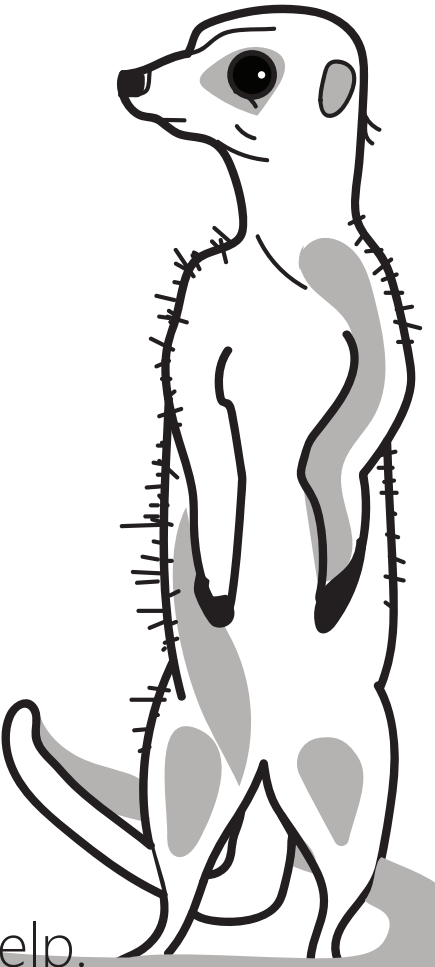
Allow written cheat sheet on tests

Plan with pseudocode, wire-framing, mock-ups

https://aka.ms/tealsnotebooks

Classroom Presence

Ensure all students receive support



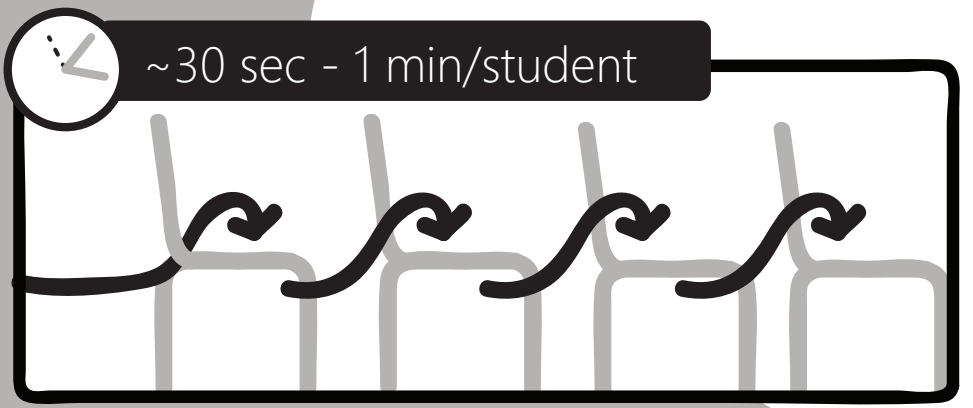
Quick interactions (30-60 seconds)

Triage through Socratic Questioning

See each student and check-in even if they did not ask for help.

Ask open ended questions, not Y/N questions:

"What are you working on?"



https://aka.ms/tealsmeerkat

Socratic Questioning

Diagnose

"How are you doing?"
"What is this supposed to do?"
"How does it work?"

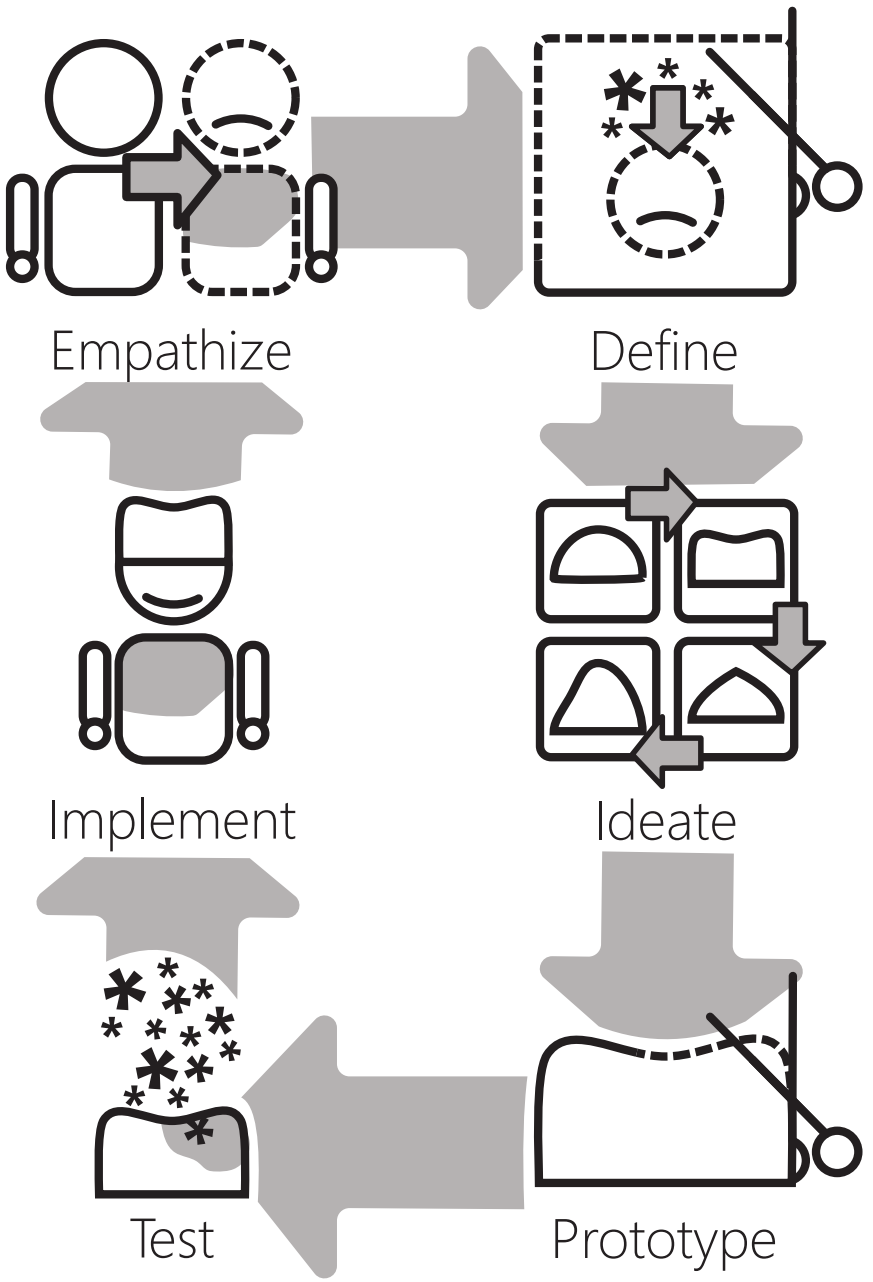
Ask Leading Questions

"Where would be a good place to put a print statement?"
"What can you do to isolate the problem?"

Give an Actionable Next Step

"Think back to lab 3.2 and see if that helps."
"Trace through this loop to see if you can find a bug."
"Look at your notebook to see if you can find something similar that will help you."

The Design Thinking Process



https://aka.ms/tealsproblemsolving

Academic Honesty

Always *defer to classroom teacher and school policies.*

Tips for Establishing an Honest Baseline and Common Classroom Policies

Set **clear expectations** on a per-assignment basis: in groups, in pairs, with a buddy, solo.

> *Example:*
> During lab, students are not allowed to touch other students' keyboard or mouse.

Explicitly state the **allowed resources**: internet, textbook, notes; no external resources.

Use **face-to-face grading** of student projects.

Require students to **cite resources** used when working with peers, site collaborators

https://aka.ms/tealshonesty

Assessment Strategies

Type of Grading	Best for
Peer Grading	Homework, small assignments
Check / No check	Homework, labs
Self Grading	Homework, small assignments
Correctness	Test Quizzes
Rubrics	Projects
Comments	Any time
Written Feedback	Major Projects
Face to Face	Major Projects

https://aka.ms/tealsgrading

Formative Assessments - Quick

Data collected about what students are learning while they are still engaged in the learning process.

Quick Assessments

Choose an assessment based on the amount of time you have and how thorough you would like to be. Fewer options lead to faster but less thorough assessments.

Fists/palms or Red Cup / Green Cup


Stoplight Cards



1 to 5 fingers





Or, Everyone Writes

https://aka.ms/tealsqformative

Formative Assessments - Teacher Led

Complexity ⇕

Technique	Best for	Turnaround
Rubrics with comments	*Major projects, group assignments*	*1 week*
Student teacher conference	*Major projects, project checkpoints*	*1 week*
Correctness	*Quizzes, small labs and homework assignments*	*0-2 days*
Complete / Incomplete	*Small labs and homework assignments*	*0-2 days*

***Some useful digital tools** that can be used for continuous assessment of student progress include: spreadsheets, embedded polls in presentations, and digital forms that compile student data for easy grading.*

https://aka.ms/tealssurveytools

Resources

Questions?,
Reach out to your
local Regional Manager

TEALS Dashboard Sign In

https://www.tealsk12.org/dashboard/