

## I. AKA Science (All Kids Are Scientists) Introduction

**Impact NW:** Impact NW is the parent organization of AKA Science. Impact NW (INW) is a social-service nonprofit that works to prevent houselessness in Portland, OR. INW focuses on systemic community change for the most vulnerable populations. Rather than taking our cue from obsolete models of the past, we design for the margins. Our approach is evidence-based and focused on the data that matters. We emphasize long-term solutions. By strengthening our community connections, those in crisis find us more easily - and by collaborating with regional partners we expand our reach. Our work supports and inspires a new generation of changemakers to lead human rights advocacy. In this Impact Way, we create a strong, equitable community with opportunity for everyone. INW provides services to more than 20,000 people each year, ranging from housing & energy assistance, food & clothing resources, job training, early childhood & senior support networks, and afterschool & academic support, and more!



**AKA Science:** Originally a program of Oregon Health Career Center, AKA Science was adopted by Impact NW in 2011 and has been uplifting Portland's youth ever since. AKA Science is an afterschool science program that utilizes fun, hands-on, inquiry-based learning to encourage and develop children's natural interest in science. Our mission is to inspire a love of science, provide a safe and fun environment for children to learn about science, and help children gain confidence in their understanding of science concepts and ability to think critically to solve problems.

**Who we support:** The AKA Science program supports more than 1,400 students each year across 60 of Portland's highest need K-5, middle school, and afterschool clubs. We primarily serve low-income schools (84% of our students are Free & Reduced Lunch eligible), schools with a high percentage of students identifying as Indigenous, Black, Brown, Melanated, Latino/Hispanic, Immigrant, and Asian (72%), and communities located in East County (73%). We partner with local nonprofit agencies (Immigrant & Refugee Community Organization, Self Enhancement Inc, Latino Network, Portland Parks & Recreation, El Programa Hispano Catolico, and Metropolitan Family Services) to provide

programming at Schools Uniting Neighborhoods Community Schools (SUN schools), Boys & Girls Clubs, and the Portland Tennis & Education center.

**How we operate:** AKA Science is a kit-based program which means that we provide our partners with a complete set of supplies & materials for up to 15 students plus field-tested, easy-to-follow curriculum for instructors. Our curriculum caters to a variety of learning styles and is constantly evolving and adapting. We improve our curriculum frequently as new science becomes available and to ensure our content is trauma-informed and culturally responsive.

Curriculum topics rotate on a 4-year cycle, and we offer two primary topics each year. Topics include biology, chemistry, physics of forces & motion, physics of color & light, engineering, earth science, forensic science, and environmental science (coming 2024!) Our curriculum is designed as 8 one-hour lessons that feature 4-6 fun activities per lesson. Lessons and activities have the flexibility to be condensed or expanded based on student needs and interests. With small class sizes and flexible learning design, AKA Science is an effective program design. During 2020-2021, 96% of AKA Science youths showed increased knowledge of science concepts and improved attitudes about science.

## II. AKA Science Program Logistics:

### This section contains **VERY IMPORTANT** program notes!

1. **Parent/Guardian Documents:** Both the **Take-Home Supply Advisory** and **Consent for Publicity Form** must go home with parents/guardians on the first day of class. The consent form should be signed and returned to you (then submitted to your Site Manager).
2. **Pre- and Post-Surveys: VERY IMPORTANT!!!!** Give pre-surveys on the first day of class (and first day when new students enroll, up until your 3rd class session). Submit all completed pre-surveys to your site manager immediately. Give post-surveys on the second-to-last day (and on the last day of class for anyone who was absent). Submit all surveys to your site manager. Surveys are available on our website if you need more. [www.akascience.org](http://www.akascience.org).
3. **Your Kit of Supplies:** Most of your supplies are pre-bagged by class. If a supply is too large to be included in the class bag, it is packed loose in the kit-box. Additionally, some supplies are carried over from one class to another, and so you will need to move those into the appropriate class bag as needed.

*Each class bag is labeled with 3 lists:*

- supplies contained in the bag
- additional supplies that you will need to grab from outside the bag

- supplies from that class that you should make sure to keep for future classes

**Worksheets, paper, flat supplies, surveys, etc. are stored in folders in your kit-box.** Be sure to save all supplies indicated on the bag label (also listed in the “What to Save” column at the end of each class curriculum) for use in further activities or for proper disposal. Store kit at room temperature and away from pests. Any unused supplies leftover after the last day of class belong to your site or may be returned to AKA Science for re-use.

4. **Community of Support:** Visit [www.akascience.org](http://www.akascience.org) to access program documents such as curriculum, surveys, parent forms, training handouts, and more.

## III. AKA Science Best Practices

### Trauma-informed Classrooms:

Understanding trauma and recognizing trauma-responses will enhance your ability to effectively and compassionately support your students and contribute to a safe classroom environment.

#### 1. Types of Trauma:

- **Direct Trauma:** Trauma happens directly to the person by physically experiencing it or physically witnessing it.
- **Indirect Trauma:** Trauma not experienced directly by the person physically, but the person is impacted by it (e.g. witnessing the 9/11 events on tv or a person was home sick on the day that a school shooting happened at their school.)
- **Acute Trauma:** A sudden one time event, with a definite beginning and ending. (e.g. car accident, fire, or natural disaster).
- **Chronic Trauma:** Occurs over time, varies in severity, and cannot always be predicted (e.g. domestic violence, school bullying, ongoing neglect or abuse, living in poverty, and the effects of the ongoing COVID-19 pandemic.)
- **Insidious Trauma (i.e. Ambient or Environmental Trauma):** Trauma that is all around the person or their environment, which over time can accumulate and have the same negative effects of acute & chronic trauma. (e.g. friend living in poverty, neighborhood violence, living in a war-torn region.) Considered a subsection of chronic trauma.

#### 2. Common Observable Responses to Trauma:

- **Fight: Physiological arousal**

- a. Bullying, violent behavior
- b. Outbursts
- c. Trouble concentrating
- d. Hyperactivity or "silliness"

- **Flight: Withdrawal/escape**
  - a. Social isolation
  - b. Avoidance of others; sitting alone
  - c. Running away
- **Freeze: Dissociation/numbness**
  - a. Constricted emotional expression
  - b. Stilling of behavior
  - c. Overcompliance & denial of needs

**3. Resiliency:**

The ability to "bounce back" from trauma or a triggering event. Protective factors can promote resiliency, help youth heal, and support prevention efforts. Protective factors include the following system based on *Collaborative Problem Solving* by Bruce Perry.

**4. Getting Back "Online":**

- **Regulate:** helping a student come back to a "calm" state. Focus on soothing child, making them feel safe, calm, and cared for
- **Relate:** Be sure you internally recognize the potential power dynamic here and take extra time to acknowledge the situation the child is experiencing. Validate their feelings with your words and tone of voice, "*I understand that when [insert event] happened it made you feel [insert emotion.] I know you're upset right now,*" or "*This is very hard.*" Focus on connecting with students; separate out your own needs and focus on students. Ask yourself "what

FIGHT	FLIGHT
<ul style="list-style-type: none"> <li>• Anger</li> <li>• Irritability</li> <li>• Aggression</li> </ul>	<ul style="list-style-type: none"> <li>• Anxiety &amp; Fear</li> <li>• Panic</li> <li>• Worrying</li> </ul>
FREEZE	FAWN
<ul style="list-style-type: none"> <li>• Immobilization</li> <li>• Dissociation</li> <li>• Depression</li> </ul>	<ul style="list-style-type: none"> <li>• People Pleasing</li> <li>• Can't say NO</li> <li>• Prioritize others</li> </ul>

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Dysregulation occurs when the brain responds to sensory input in a manner that triggers the alarm state.

When a child is dysregulated, it is harder to listen, comprehend, and cope.

### Remember the Three "R"s

**Regulate**

focus on soothing your child. Make them feel calm, safe, and loved.

**Relate**

Validate their feelings with your words and tone of voice. "I know you're upset right now." "This is very hard". Focus on connecting with your child.

**Reason** Once your child is calm, now it is time to talk about alternatives to behaviors while reinforcing limits you set before. You can reassure them you love them but that the behavior they're exhibiting is not ok.

Until a child is regulated, they are unlikely to relate to you (feel connected & comfortable). And until a child is related, they are unlikely to have the mental capacity to reason with you.

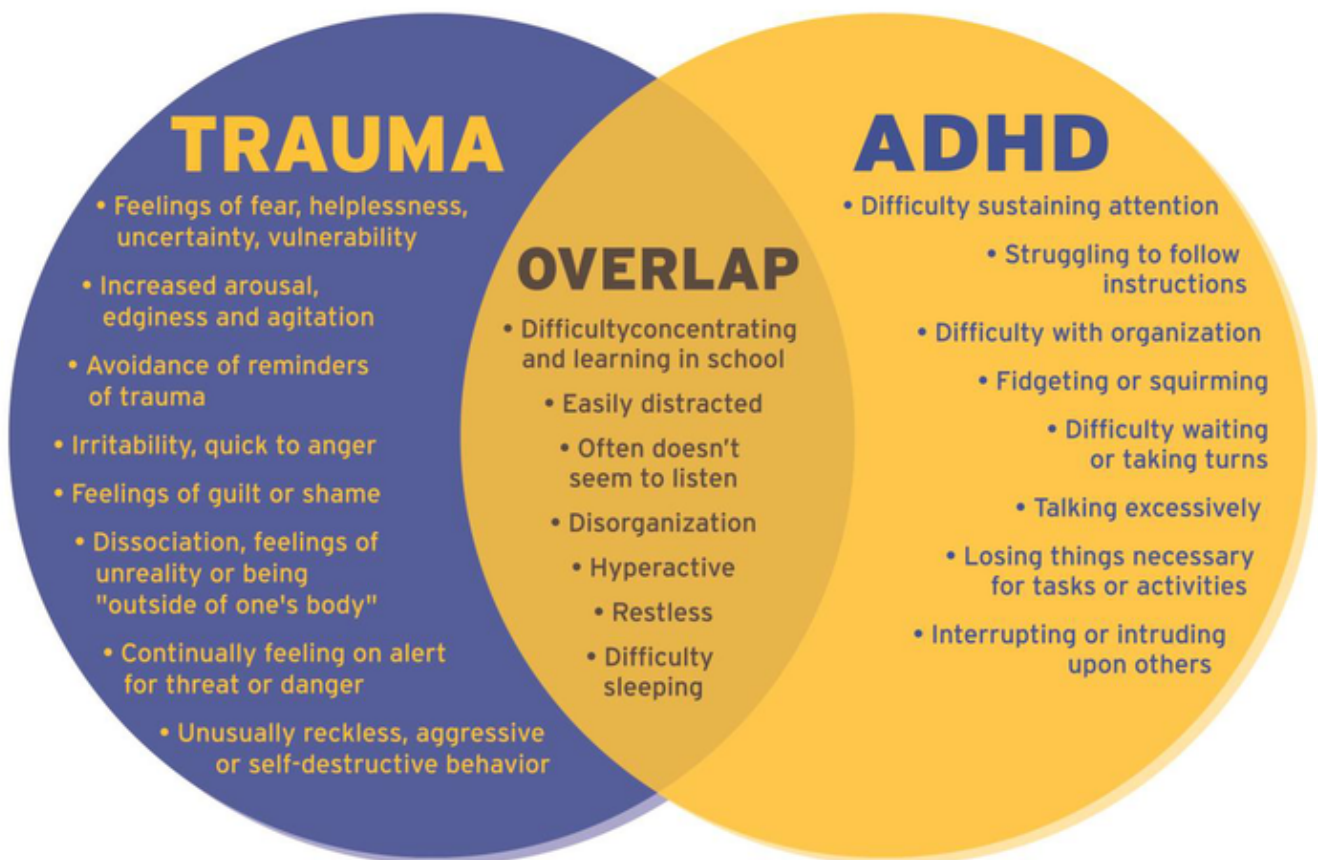
happened to this child” vs “what’s wrong with the student.”

- **Reason:** Once the student is calm, take time to talk to them about their behavior and make a plan for next time.

**5. Once the Student is back online:**

- **Mindfulness:** Being fully present in the moment without judgment. Mindfulness is a great regulation tool and supports students to “get back online” and to a calm state. Examples of mindfulness activities are breathing, meditation, stretching, drinking water, taking a short walk, and coloring or making art.

**6. Other things to keep in mind:** Neurodivergence (e.g. Autism Spectrum Disorder, ADHD) can sometimes mimic signs of trauma. Our next section discusses “Differentiated Education” which may help guide you to better engaging all students in your classroom.



**Differentiated Education:**

Differentiated education means tailoring instruction to meet individual needs. Whether teachers differentiate content, process, products, or the learning environment, the use of ongoing assessment

and flexible grouping makes this a successful approach to instruction. In essence, this is meeting students where they are at.

**1. Different needs:** Classrooms are filled with students who have different needs, come from different educational backgrounds, have different attention spans and interests, have different language skills, and have different cultural backgrounds. As shown in the diagram above, some children with different neurological presentations may mimic trauma in their behavior.

You can modify and adjust the way you teach and interact with your students and the content to support the variety of learners in your classroom. For example, neurodivergent students may need more (or less) time to process activity instructions or transitions. Younger students may need activity steps simplified, whereas older students may need additional challenges within activities.



Adapted from Tomlinson & Maker (1982)

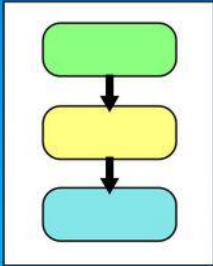



**2. For younger learners:** take time to walk through more complicated steps and concepts – reduce the number of steps by prepping activities in advance (e.g. activities with fine motor skills could have some steps prepped in advance) and modeling each step. You can show pictures or demonstrate concepts, with the goal of students understanding basic concepts as opposed to completing the task at hand (e.g. when building circuits to make DIY cars, the end-goal should be understanding that circuits exist and a basic idea of what they are as opposed to completing the car itself).


**3. For older learners:** challenge them to take the activities and experiments further – prep extensions in advance (materials or questions) that will encourage them to think beyond what the lesson calls for. Provide leadership opportunities for students where they build upon activities, support younger learners, or take a more active role in the class.

**4. For higher-need students:** ask your Site Manager for an assigned para-educator or assistance during class time. This will allow you to focus on all the students in your class.

Tips to consider for all types of students/ learners: Get kids outside! Try doing your lesson outside (e.g. Working on a bug activity? Try seeing if kids can find real life bugs outside in the school yard!) Ask students how they could take the activity further (e.g. Dissecting owl pellets? Try seeing if kids could construct a full skeleton with the bones that they find!)

## Differentiated Instruction Examples

<p><b>Graphic Organizer</b></p> 	<p><b>Hands-on Activity</b></p> 	<p><b>Students Choose</b></p> 	<p><b>Stretch Break</b></p> 
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## Inquiry-based learning

*“Tell me and I forget, teach me and I may remember, involve me and I learn.” – Attributed to Benjamin Franklin, from an ancient Chinese proverb*

Inquiry-based learning is a form of active learning that starts by posing questions, problems or scenarios—rather than simply presenting established facts or portraying a smooth path to knowledge. The process is usually assisted by a facilitator.

- 1. Make space for questions.** Instead of “telling”, start by “asking.” Make time for and encourage questions. Provide multiple opportunities for group discussions and brainstorming. A **Pair & Share** approach (i.e. talk to you neighbor then



report back) is a great, low-risk activity for inspiring a group to start thinking.

### Examples of Inquiry-Based Questions:

- *What do you notice about it?*
- *What does it remind you of?*
- *What do you wonder about it?*
- *What do you think this does?*
- *What would happen if we...?*
- *What are some ways we could test our hypothesis?*
- *What tools or information do we need to solve this challenge?*

As you may have noticed, inquiry-based questions tend to be more open-ended rather than closed-ended. Closed questions include yes or no questions, whereas open-ended questions tend to create space for the student to think, plan, wonder, and typically result in more questions!

### Tips to consider:

- **Picture books may help engage younger students with the topic.** After you read, you can make connections to the upcoming activity with inquiry-based questions (e.g. *The main character built a boat out of leaves. What other materials would make a good boat? How would you build it? Let's try!*)
- **Objects may help engage tactile learners.** (e.g. *What do you notice about these paper clips? Yes! They are metal and bendy. What could we build with these?!*)
- **Pair & Share may help students build confidence with asking questions and sharing ideas with their peers.** (e.g. *How are birds similar/different from humans? Talk to your neighbor and come up with your ideas! You'll have the opportunity to share ideas with the rest of the group in a moment.*)
- **It's okay if you don't know the answers!** The key here is to give space for students to wonder and think, guide them to where they can find answers, and if applicable, find those answers with them! It's okay to say, "I don't know" but consider following it up with, "I don't know YET. Let's find out together." The goal of inquiry-based learning is to practice asking questions, taking time to observe, and getting comfortable with discussing ideas with peers.





**2. Student voice & choice:** The more students have a voice or choice in their learning the more engaged they are. Your capacity to provide student voice or choice in your classroom might depend on a lot of things, such as available time, materials, location, and so on, and that's okay! Consider making space for voice or choice wherever it best fits in your classroom model. This could be done by letting students steer the conversation (e.g. *What questions do you have about science?*



*What kinds of experiments are you interested in?*) or letting students choose between 2-3 activities (e.g. *We have supplies to make a model bridge or dissect owl pellets; which would you like to do today?*) In some cases, student voice or choice might mean that you just let the students play with some materials before the activity (e.g. popsicle sticks!) so they get to creatively explore the materials before you start the activity.

More on play... Spending a whole class session just playing with new materials is never a waste of time, particularly for younger learners (e.g. K-3.) Exploration of materials pays off, especially when a more in-depth activity follows. Their desire to touch and play has already been fulfilled and now students can focus on the instructions better and come up with more intentional questions to experiment with. The prior experience with the materials builds a foundation that they can add to as they proceed with the activities.

**3. Use visual aids, such as pictures, demonstrations, models, and 3D objects** to accommodate a wider range of language or learning abilities. Visuals can relay more information than you'd imagine! There are enough supplies in your kit that you can do the activity on your own beforehand. This is a great way to show students how to do tricky steps or to provide an example of how the activity might look. Another useful resource are online videos! There are a number of online videos that relate to AKA Science topics that might engage your students if they respond well to video media.

**4. Celebrate mistakes & let experiments play out.** Making mistakes and having a "failed" experiment provide the opportunity for students to learn and refine their process. Encourage students to discuss how they set up their experiment and discover which variables were successful, unsuccessful, or neutral. You can celebrate what they DID achieve (e.g. they got the legs of the robot to work, they discovered that the crayon has to be on the bottom of the

boat, they uncovered the spot that malfunctioned and can make a plan to try it differently next time!) Whenever possible, allow students to re-try, rebuild, reimagine their experiments!

Consider the idea of "Growth Mindset": Students who experience ambient and chronic trauma are in a constant "flight, fight or freeze" state which can lead to a fixed mindset (e.g. "Nothing is going to change. Nothing is going to get better.") Helping students to believe they can overcome a challenge or obstacle. The power of "yet": "I don't can't do this" changes to: "I can't do this yet, I'm still learning." Growth Mindset acknowledges that we all start our learning somewhere and, with practice, we can get better at whatever it is we are working on. There is also an idea of "Productive Struggle" which emphasizes that complicated ideas can be hard to understand, but we should be open to learning about them.

- 5. Reflect & make connections.** During your "Daily Debrief," we invite students to reflect on what they just learned and experienced. This could be a group discussion, or you could have students write in their lab notebook. We provide discussion prompts that encourage students to share ways in which what they've learned directly connects with other things they've experienced in their lives, though you are welcome to ask your own debrief questions!

Other debrief ideas: "**Rose-Thorn-Bud**" model, which is designed to acknowledge a student's "successes," challenges, and opportunities to grow. The following example demonstrates the line of questioning to get kids thinking about what their individual Rose, Thorn, and Buds will be (if they choose to share).



- **Rose** - *What was the highlight of your time in class today? What was something that you did today that was successful? What part of today made you most excited/ happy? What is a skill that you discovered you had or something you learned you could do?*
- **Thorn** - *What was something challenging or difficult that you did in class today? Was there a particular activity where you noticed yourself struggling?*
- **Bud** - *What are you looking forward to the next time we meet? What is something you'd like to learn more about? What are skills you'd like to get better at? What is an experiment you'd like to try? How will you share what you learned today?*

## Classroom Management:

The following are tips and tricks for managing your AKA Science classroom behavior.

### 1. Set the Tone:

- **Land Acknowledgement:** A Land Acknowledgement is a statement that recognizes and respects Indigenous Peoples as traditional stewards and caretakers of this land. It also identifies the enduring relationship and connection that exists between Indigenous Peoples and their traditional territories. Some instructors like to read this acknowledgement aloud before they start a new AKA Science term (Class one) then facilitate a short discussion afterwards. Please see the *Land Acknowledgement* handout for example read-alouds and follow up discussion questions.
- **Class Agreements:** On the first day of class, facilitate a student-led discussion to establish class agreements (e.g. class rules, ground rules, learning contract) that everyone agrees on and will be held accountable for. Write out the rules using your students' own words. Once you have an established list and all your students have agreed to it, have them "sign" it somehow—whether that is a thumb print, a signature, a shape, initials—anything that is unique to each student. You are encouraged to do a quick review of the class agreements at the start of each subsequent class.
- **Create a daily routine (e.g. circles, check-ins, stretches, debriefs).**
  - a. **Check-ins:** One method is to form a standing circle at the beginning of every class period and invite students to participate in the **"thumb meter."** First, students vote on how they are feeling physically right now (e.g. thumbs up means you feel great or comfortable; thumbs down means you feel terrible, sick, or hungry). If it feels safe to do so, you can move on to how students are feeling



emotionally (e.g. thumbs up means you feel happy, confident, energized; thumbs down means you feel sad or mad or want to be left alone). As a response to where your students are at either physically or emotionally, you could then guide students through a series of stretches or breathing exercises to orient them to the space and calm their bodies. Be mindful of the vulnerability that this activity could inspire. Ensure that students know it is a “challenge by choice” and that they are not required to participate. You could also have students “vote” in pairs (e.g. Pair & Share).

Alternatively, if you have a little more time or you’ve got a small group, you could try “**popsicle/ poopicle**” where students to share the best part of their day (i.e. popsicle) and the most challenging part of their day (i.e. poopicle).

- b. **Stretch breaks:** As part of your daily routine, you’ll also consider implementing regular **stretch breaks or breathing exercises** to calm students and hit “reset” when you need to. This is especially important when you have neurodivergent students - they may require more movement to stay focused.
- c. **Cleanup:** Additionally, be sure to implement a **daily clean up routine** that is fun and provides students with a chance to be extra helpful.

Example clean-up routine:

Make it a hunt for the “**secret scrap**” or create a role-playing game where your class is a group of super sleuths and they have to cover their tracks lest they be found out! Time them (and try to beat their last time) or play a song where you have to show off your dance moves while you clean up (further, you could assign certain dance moves for certain kinds of clean-up roles! Make it fun!

## 2. **Establish attention-getters.**

Agreeing on a set of attention-getters can be a part of establishing your class agreement. Habituate your students to the attention-getter by practicing it a few times. Always be



mindful of your tone when communicating with your class. Because students will often match your voice level, we advise that you use a calm and clear tone.

- **Verbal Call & Response:** *1,2,3 eyes on me!* (student response is *1,2 eyes on you!*), *Bap-bada-bap bap* (student response is *Bap bap!*)
- **Physical Call & Response:** *Gimme ten!* (students have to raise up both hands, fingers spread, nothing in their hands, ready for instructions); *If you can hear me...* (e.g. *touch your nose! Touch your ear! Wiggle your pinky finger!*); *clap patterns*
- **Clear Instructions:** *You can show me you're ready by...* (e.g. having your desk cleared)
- **Sounds or instruments** (e.g. a chime)

### 3. Establish, model, and discuss behavior expectations.

Reviewing how you'd like your students to behave and communicate with you is vital. Have a discussion about the importance of hand-raising or implement regular calming stretches/breathing exercises when students get too noising/rowdy. Come up with a fair approach for when a student is being unsafe or speaking out of turn.

**Scenario: Struggling with transitions** (e.g. moving on from one activity to the next, moving from discussion-based activity to a hands-on activity, or moving from one step or supply to the next).

- **Modeling what is expected** can sometimes help! (e.g. *in a moment but not yet, I will be passing out pencils. When you get your pencil, put it on your desk like THIS.*)
- **Give a heads-up that a transition is coming.** (*In 5 minutes, we will be moving on to the next activity. Start wrapping up your project now. When the 5 minutes are up, I'll ask you to please clean up your project.*)
- **Redirect with leadership tasks.** (*I need your help passing out supplies while we transition to a new activity!*)



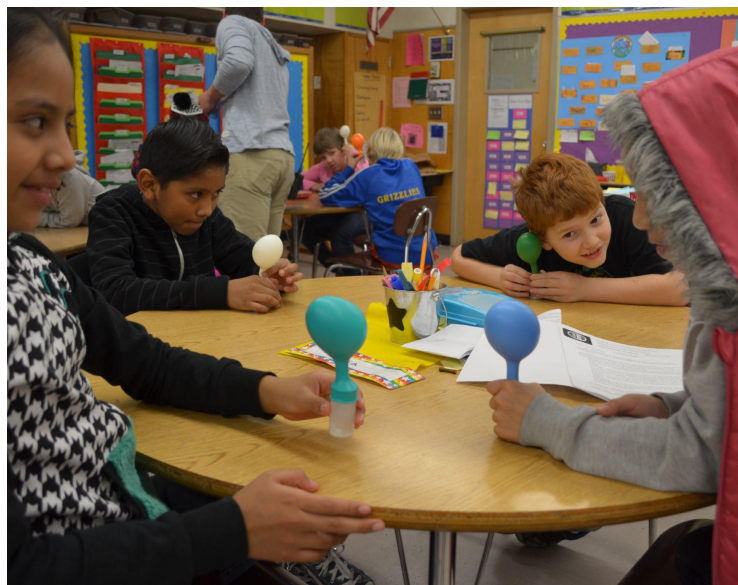
### **Scenario: Unsafe supply use**

- **Refer to class agreements** (e.g. *Hey class! Remember our class agreements? Do we throw things?!*)
- **Positive behavior narration:** Acknowledge when students are using their supplies safely (e.g. *I notice Loretta is using her tweezers very carefully!*)

- **Review instructions:** Sometimes students misuse supplies because they didn't hear what the instructions were. In other cases, it's a signal that students need some re-focusing/redirecting. Taking a moment to tell a student you'll run through the steps with them can help and/or remind a student to refocus their attention and follow the instructions. You can also remind the WHOLE class of the procedural steps.
- **Take supply away** for a while until they can agree to use it safely again. (*I notice you are using this supply in an unsafe way. Can you show me you can use it safely?*) and if they repeatedly use the supply unsafely: (*I see you are using it unsafely again, I can't let you do that because you could hurt yourself. I'm going to take it away for a little while. It will be here for you when you are ready to agree to use it safely. What other ways can you participate in the meantime?*)
- **Physical reset:** Taking a moment to cool off and stretch or breathe can be effective. If you notice one or more students using a supply unsafely, encourage the entire class to take a break to breathe and stretch then try again.

### Scenario: Speaking out of turn

- **Refer to your class agreements.** Remind the entire class (*How did we agree to communicate in class? Yes - we raise our hands!*)
- **Remind students that right now it's time to listen.** No other voices should be talking, especially when instructions are being given. If you notice an individual student struggling with speaking out of turn you could discreetly check in with them one-on-one (*I'm noticing that you are struggling to control your voice today; what can we do about that?*)
- **Try more Pair & Share.** If you have a lot of kids speaking out of turn that may be a signal that more chances for students to speak are needed. Frequent Pair & Share is a great way to encourage open conversation.
- **Redirect restless energy with leadership-based tasks** (e.g. give spirited students jobs such as the passer-outer of supplies, or let a student who has done the activity before help you demonstrate the steps. That said, leadership opportunities



should be equitable so be sure to provide everyone chances to develop this skill.)

- **Physical reset:** Do a whole-class breathing/ stretching activity if more than one student is struggling to control their voice, sometimes a whole-class physical reset can help set the tone.
- **Seek support:** If disruptive behavior persists, please seek the support of your site manager. Checking in with parents may be necessary.

#### 4. Good practices.

**Read through your lesson plan and test out activities BEFORE class.** There are enough materials in your kit for you to make one sample experiment. Let AKA Science know IMMEDIATELY if any supplies are missing and/or damaged.

**Pace how and when you pass out your activity supplies.** Passing out all the materials for an activity all at once can sometimes be distracting for students and they may not hear the instructions if they are busy fidgeting with loose supplies. Try passing out materials slowly and only as needed.

**Move on from activities that aren't working** or aren't engaging your students. Moreover, spend more time working on the activities that are working and are engaging your students! It's okay if you just get through one activity for the entire class time!

