



NGSS YOUR SCIENCE CLASS
Science Teacher Tribe



science Talk

How To Make It Matter

Science Talk: Making Discussions Productive

EMBRACING THE TALK

Whether we always like it or not, our students are going to talk. And honestly, they should be! Adolescents are social creatures. When we attempt to stifle that natural developmental drive, we run into all sorts of classroom management issues as our students become disengaged and our classroom environment suffers. Our students need to talk. That said, it is our job to channel that talk into productive discussions that support student discovery and learning. I know, I know - easier said than done. So how can we embrace the talk in our classroom? Let's take a look!

WHAT DOES PRODUCTIVE TALK LOOK LIKE?

Before we dive into the *how*, let's review what productive science talk *is*. What does it look like?

1. All students participate.

In productive science talk, all students should have the opportunity to participate. That means everyone can hear and be both *heard* and *understood*. Moreover, students are *motivated* to participate. Students want their voices heard, feel that they have a stake in the conversation, and feel supported in sharing their thoughts and ideas. The teacher and the students recognize that it is both a right *and* a responsibility to contribute.

2. The conversation is focused, rigorous, and leads to deeper understanding.

In science discussions that matter, students are focused on the content at hand. There is very little wandering, and student contributions are relevant. And when they aren't (because we all know that happens), the conversation is quickly redirected back to what matters.

3. The teacher acts as a guide, helping students practice new ways of communicating and collaborating.

Productive science talk doesn't come easy. We know students know how to talk, but that doesn't mean they know how to *discuss* their ideas, share their thoughts, *listen* to others (and actually process it). The skills involved in productive discussions are skills that many *adults* haven't mastered, so we can't expect our students to come into class knowing how to do this. These are skills we must teach, model, practice, and repeat - over and over.

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Setting the Stage: Creating A Culture That Allows For Productive Talk

While this isn't the place to get into the nitty gritty of creating classroom culture - that will have to be a lesson for another day - there are some things you can do to ensure that you have set the stage for productive discussions.

1. First, you have to believe that this is a valuable learning activity, and that all students can learn from it. Question-and-answer sessions are quick. They are easy. There is a right or wrong answer, and you can move on. Unfortunately, those types of "discussions" are not creating environments where students are empowered to explore and share their own ideas, listen to others, and take risks in their learning. Productive discussions take time, and it's important not to rush them. Before you decide to go down this path (and I wholeheartedly think you should!), you must be prepared to give the activity the time it deserves, knowing that students will come out of the discussion knowing, understanding, and being able to do more. (And also, knowing that it takes time to master this skill, and it's certainly a process. It's ok if your first discussion isn't a masterpiece!)

2. Second, you must have well-established procedures and expectations. Often as a teacher, giving students the freedom to talk is terrifying. You are relinquishing some control, and it can get rowdy - particularly if you haven't taken the appropriate measures to keep it focused and contained.

3. Third, you have to have a clear academic purpose and a strong understanding of the content. Discussions can have different purposes -- uncovering student ideas, consolidating understanding, interpreting data, or crafting explanations supported by evidence and reasoning. It's important to know the ultimate goal, so that you can craft your questioning to lead toward that goal. Additionally, because in some sense "all is fair" when it comes to student talk, you must have a strong understanding of the content so that you can connect with the thoughts and ideas students bring up. Understanding how they think, how it actually works, and how to get them from A to B is going to influence the way you guide the discussion, the questions you ask, and the observations you make.

4. And fourth, speaking of questions and observations, you must have a game plan. You will need a question to launch the discussion, and you will want to have a few follow-up questions to move the conversation forward. Crafting a great starting point is vital to fostering great science talk. Moreover, you must know how you will set up your discussion, and you will need to provide students with the necessary scaffolds to succeed in this format. Productive talk can happen in whole-group settings, small-group, partners, non-verbally, incorporating movement, etc. Each of these strategies will require a unique approach and different tools, and some strategies will be more appropriate than others for your purpose and content.

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TALK FORMATS FOR DISCUSSION

While there are truly an unlimited number of talk formats (just do a quick Pinterest search to find some!), they typically fall into three categories. Each has its benefit and drawbacks, and some work better for certain purposes than others.

1. Whole Group

In a whole group setting, the entire class focuses on making sense of a problem or phenomenon. Because everyone is together, all ideas shared are heard and all students benefit. Additionally, the teacher can have a great hand in facilitating the discussion, as they are more available to encourage students to expand upon their ideas, ensure that all talk is respectful and relevant, and ensure opportunities for all to speak.

2. Small Group

In a small group setting, students work in groups of three or four to share ideas, explore materials, and come up with solutions or explanations. While the teacher is circulating, much of the discussion is happening outside of their direct purview. For that reason, it's incredibly important to have well-established expectations and management, to structure the task so that it requires collaboration to accomplish, and to have some way to hold all students accountable. That said, there are benefits to small-group discussion. Students are typically more willing to share their ideas in small groups, especially if there any language or other academic barriers that may affect their confidence in speaking to the class. Small group talk is often more "raw" and can provide a gateway for students to organize their thoughts before participating in a whole-group discussion.

3. Partners

Partners can be a valuable format, as well. Partner talk is incredibly low risk, so there is less barrier for students to share their ideas. It is also typically very quick - it can be utilized amidst activities, notetaking, or even during whole group discussions. It is very much a "practice ground" where students can begin to formulate their ideas, turn them into verbal expression, and truly refine them. The practice can help students gain the confidence they need to share that idea at large, and there are strategies you can use in the follow-up that will give voice to the ideas of students who may not be ready to speak at that time.

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TALK MOVES BASED ON DISCUSSION GOALS

So you believe investing in student talk is worth it, you have established the classroom culture to support it, and you have your task and format all situated. It's game day. What do you do now?

Because productive student talk doesn't just happen, we need to be prepared to guide our students in practicing these new ways to talk, to listen, and to contribute to the class's learning. While eventually this will come more naturally to you, in the beginning, it can be a challenge to determine what to say to facilitate these productive discussions. Talk moves break that down for you. Below, you will find a list of questions for each of the potential goals for student talk.

Please note, several goals may (will) be integrated into each and every discussion. Students may need to expand on their ideas before you dive into refining reasoning, after all. And even as students refine their reasoning, you may ask them to expand upon that reasoning or connect it to others' ideas. These questions have only been broken down to provide structure to this resource. As you use them, you will find how very integrated they all are.

Goal 1: Help Students Expand On, Clarify, and Share Their Own Thoughts

- "Can you say more about that?"
- "Can you expand more on your thinking?"
- "Can you give us an example?"
- "Tell me more about that."
- "Take your time. We'll wait."
- "Let's take a minute to write our thoughts down."
- "I heard you saying... Do I have this right?"

Goal 2: Help Students Listen To One Another

- "Who can repeat what ____ said?"
- "Who can rephrase what ____ said?"
- "What do you think ____ is saying?"
- "What is something you heard during your partner/small group discussion?"

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TALK MOVES BASED ON DISCUSSION GOALS

GOAL 3: Help Students Refine Their Reasoning

- "Why do you think that?"
- "What's your evidence?"
- "How did you arrive at that conclusion?"
- "What from the text/activity/lab made you think that?"
- "Where is there evidence to support your idea?"
- "What makes you think that solution will work?"
- "Can you prove that?"

GOAL 4: Help Students Interact With Others

- "Do you agree or disagree? Why?"
- "Do you think the same thing as ____ said?"
- "How is your idea similar to/different than ____'s idea?"
- "Does anyone want to respond to that idea?"
- "Who can add on to this?"

When I'm explaining my ideas...

I think _____ because...

Evidence that supports my argument is...

I think this is supporting evidence because...

This relates to the scientific idea of...

This reminds me of _____ because...

When I'm listening to others'**ideas...**

Can you tell me more?

Can you give me another example?

I think you are saying _____. Is this what you mean?

Why do you think that?

What evidence supports your idea?

How did you get that answer?

So you are saying...

Can you say more about _____?

I don't understand. Could you clarify _____?

Based on _____, I would like to ask...

I still have questions about _____.

When I'm responding to others'**ideas...**

I agree with _____ because...

I disagree _____ because...

What you said about _____ is similar to mine because...

I would like to add...

Could it also be...?

Have you considered _____ because...?

When I'm explaining my ideas...

I think _____ because...

Evidence that supports my argument is...

I think this is supporting evidence because...

This relates to the scientific idea of...

This reminds me of _____ because...

When I'm listening to others'**ideas...**

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When I'm listening to others'**ideas...**

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I still have questions about _____.

When I'm responding to others'**ideas...**

I agree with _____ because...

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What you said about _____ is similar to mine because...

I would like to add...

Could it also be...?

Have you considered _____ because...?

NGSS Your Science Class

2018 • 12 Modules

Class Overview

NGSS Your Science Class is a 12-module course for teachers looking for assistance as they shift their class curriculum and instructional strategies to align to the Next Generation Science Standards.*

Course Content

Objectives:

- bundle standards, create storylines, and identify anchoring phenomena
- use performance expectations to construct three dimensional assessment tasks
- develop unit plans true to the intent of the 5E model
- utilize formative assessments that really work
- incorporate science and engineering practices and literacy strategies
- differentiate for all learners

Course Creators

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Course Format

Each Module Includes:

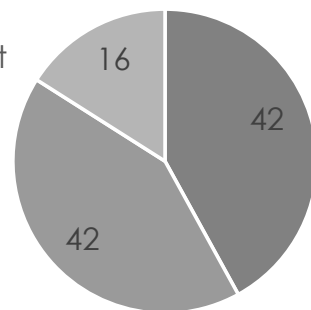
- video workshop
- audio-only version
- video transcript
- module workbook

Membership Includes:

- weekly Zoom PLC Chat
- Sample Aligned Resources
- Personal Feedback

Course Breakdown

- Curriculum/Unit Planning
- Instructional Strategies
- Assessments



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2018 • 12 Modules

module TOPICS

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Bundling The Standards

3D Instruction

Storylines

Formative
Assessments

Anchoring Phenomena

3D Assessments

Literacy, Vocabulary,
& Notebooking

5E Unit Planning

Deep Dive: Science
& Engineering
Practices

5E Deep Dive 1

5E Deep Dive 2

Differentiating For All
Learners

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