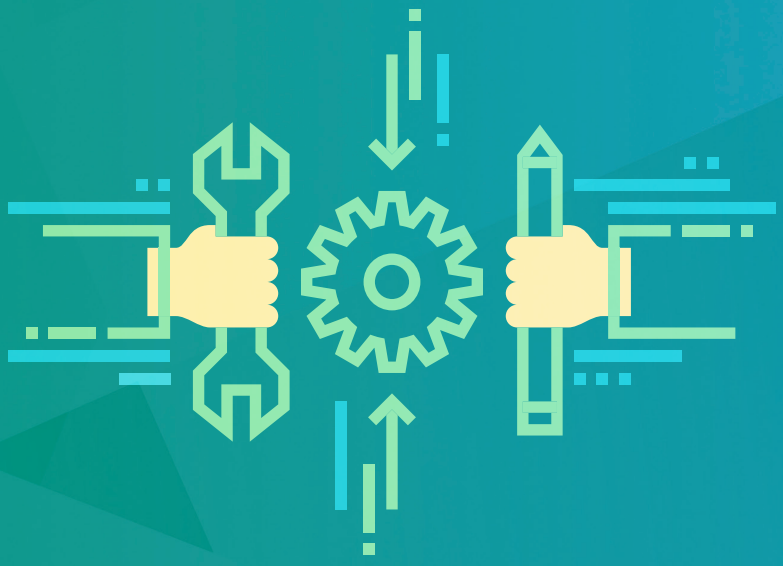


Mainstreaming Making:

A Toolkit for Building Support for Making Among Classroom Teachers and Administrators

EdSurge Research

Mainstreaming Making:

A Toolkit for Building Support for Making Among Classroom Teachers and Administrators

An instructional coach who serves middle school teachers and students in a public school tries to work in making concepts and activities where she can. Last year, she offered an optional professional development workshop on using design thinking to her school's teachers. This year, she's working with the school's science teachers on developing a week-long engineering module in which students use making to design and create functional arcade games out of cardboard. When she works with individual students on projects in the classroom, she tries to model making practices she's learned over the years: empowering students—not teachers—to be experts, encouraging students to take risks and working with students on reflection exercises.

There's just one problem. The instructional coach feels very much alone. She wants to find a way to ensure making concepts and activities become core to the culture of her school. How can she make making happen more routinely and more seamlessly?

GETTING BUY-IN FROM ADMINISTRATORS AND CLASSROOM TEACHERS

The instructional coach needs to find a way to interest administrators and better support classroom teachers in making. That's a pretty tall order.

Where should the instructional coach start? She can begin by looking at resources on making. Flip to page 23 to check out some of the great resources that EdSurge Research has compiled.

But there's more that the instructional coach can do. In this toolkit, we've identified steps that instructional coaches, makerspace leads, librarians, media specialists, tech coordinators and other non-classroom educators can take to generate buy-in for making concepts and activities in their schools. At each step, reflect on your own circumstances, goals and experiences, and learn which actions you can take to advance making in your school community.

WHO IS THIS TOOLKIT INTENDED FOR?

Instructional coaches, makerspace leads, librarians, media specialists, tech coordinators and other non-classroom educators who want to build support for making practices, concepts and activities in their school.

Before You Begin: Identify Your Primary Stakeholder

BEFORE YOU BEGIN: IDENTIFY YOUR PRIMARY STAKEHOLDERS

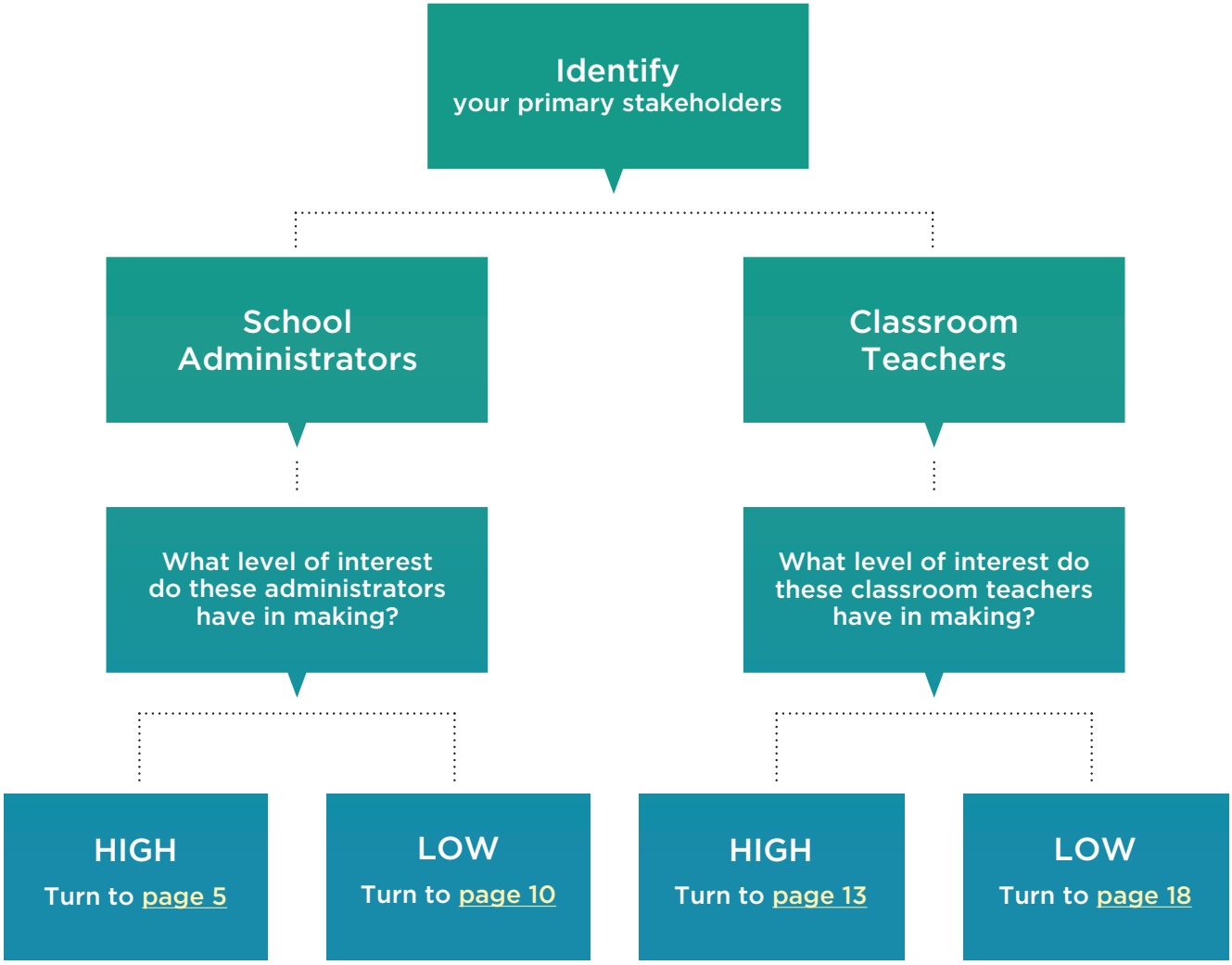
Below are some examples of interactions that you might have with administrators and classroom teachers in your school. Which of these examples sound familiar to you? Which ones don't apply?

EXAMPLE	APPLIES	DOESN'T APPLY
The school principal sees some of my students using making practices to create objects that help senior citizens in day-to-day life. She asks me why I am spending my time supervising arts and crafts projects.		
A science teacher in my school tells me that she'd like to use making in the classroom but can't devote the time to learn new computer programs.		
The district administrator went to a conference and heard about a neighboring district's robotics team. She tells me that I should apply for a grant to run an after-school robotics club.		
An ELA teacher asks me if I have any making-related activities that are aligned to the academic standards he must cover in his classes.		
A social studies teacher in my school likes to lecture. When I suggest that he introduce group projects, he tells me that he's concerned that students won't take group work seriously.		
The school principal read about making and asks me if I can lead a professional development workshop on making. When I ask for a budget, she replies, "I thought you only needed tape and cardboard."		

REFLECT

Which of these scenarios resonate with you? Were you more likely to interact with classroom teachers or administrators about making? Was the person you were interacting with more likely to be interested in making? Or was he or she skeptical?

Based on your reflection, choose your **primary stakeholder**—the person you **most** want to engage in making and determine his or her existing level of interest in making. Use the following chart to guide your journey through the remainder of the toolkit.



Reaching Administrators Excited About Making

Great news! Administrator buy-in is hugely important for making any initiative, especially making, stick across a school. But busy administrators may not always have a good handle on what making is or what it can achieve in their schools. Consider the following examples:

- An administrator is preoccupied with declines in students' math scores on a standardized test. She has approved a pilot to bring making into the classroom but suggests putting it on hold so that teachers can focus on improving students' math scores.

- An administrator supports making as a concept, but he declines to provide release time for a history teacher to attend a conference about making in the humanities or funding for an instructional coach to buy supplies for a making professional development workshop for faculty.

- An administrator supports the local museum offering a school-wide assembly on earthquake-proofing building design that incorporates making practices in a follow-up breakout session. But that same administrator shoots down an idea of bringing making into everyday math and reading lessons.

To convince even an enthusiastic administrator to support making education more broadly, consider anchoring your proposal on the existing views and needs of administrators upfront. This approach will reduce conflict and suggest making as integral to the school's success rather than an add-on.

> **Since my STEM lab is a marking period class, [district administrators require that] every lesson that I do has to be aligned with the standards... I'll design a lesson and then what I'll do is once the lesson is designed then I'll figure out what standards I could apply to the lesson.**
>
> Keri Scheinbach, middle school STEM and gifted and talented teacher in Dumont, N.J.

STEP 1:

What do your administrators think that making is?

Below are pairs of phrases that administrators may use to describe making. For each pair, circle the choice that better expresses the view toward making that your administrators hold.

DESCRIPTORS FOR MAKING	
Useful in one-off cases	Should be integrated into day-to-day learning
Really about the process	Really about the product
Useful for STEM classes	Useful in all classes
Takes a lot of resources (time, money, support)	Takes few resources (time, money, support)
Connects to our larger school/district goals	Doesn't connect to our larger school/district goals

REFLECT

Look across your responses. Do you notice any patterns? Do your administrators see making as central to the school or district's goals or teaching activities? What level of resources do they believe will support making? In which parts of the school do they believe making concepts and activities can be integrated? Can you spot any misconceptions about making that your administrators have?

STEP 2:

What priorities do your administrators have

Administrators are busy people with a slew of goals and needs. Below is a list of common administrator priorities. Rank the priorities, in order from most important to your administrators to least important, marking any that are not present among your administrators with an N/A. Feel free to add any priorities that are unique to your school or district.

COMMON ADMINISTRATOR PRIORITY	RANKING
Improve student test scores or other measures of student achievement	
Roll out a new program or approach, such as project-based learning or block scheduling	
Improve educational outcomes among specialized groups such as English language learners or special education students	
Build connections between students and the community, including parents and local organizations	
Improve academic offerings in a particular subject area such as STEM	
Offer programming to help students develop social-emotional skills	
Comply with district, state and federal curricular and reporting requirements	
Add your own:	

REFLECT

Look at the rankings that you assigned different administrator priorities. What type of priority is at the top of the list? Does it have to do with student academic achievement, community building, or something else? Are there priorities that you expect will rise to the top of the list in the future?

STEP 3:

How can you appeal to administrators' views, address priorities and counter misconceptions?

Advocates for making need to take administrators' views and priorities into account when pitching making activities and practices. This will certainly make life easier in the short term, reducing conflict and getting quicker buy-in. **This strategy of meeting administrators where they are and addressing misconceptions in the process also allows the possibility of building a more comprehensive making program in the future.**

Think back to the administrators' views and priorities you identified. What are your administrators' goals? Which approach to making would appeal most to them, a light touch or a deep, sustained effort? See the chart below for examples of broad administrator goals and ways in which educators like you may accomplish those goals through making. These may provide some ideas for how to broach making with your administrators.

GOALS	LIGHT TOUCH EXAMPLE	DEEPER TOUCH EXAMPLE
Improve student achievement	Provide data on how a making activity about angles helped students' scores on that unit improve	Provide data on how skills and knowledge (collaboration, content knowledge, etc.) improved through sustained focus on making
Improve pedagogy, instructional techniques	Offer a professional development session in a faculty meeting on how to run a design challenge	Offer professional development sessions to each department on how pedagogies associated with making can be used in their subject areas
Build community within and outside of the school	Model productive engagement between students at different grade levels by having them collaborate on a making project	Develop relationships with local businesses or non-profit organizations and create making processes and projects with local "customers" in mind
Comply with reporting requirements	Provide an example of how a making lesson can be aligned to an ELA academic standard on writing	Provide data to show the impact of school or district funding for a 3D printer
Better serve students in specialized groups	Provide testimonials from English language learners about how their confidence improved through a making project	Provide data to show the impact of a making project on various groups that the school or district is trying to better serve

WHAT'S YOUR ACTION PLAN?

Using the examples above as a guide, think about how you plan to advance making concepts and activities with your administrators. What will your first action be?

Now head to page 22 to continue developing your action plan.

Reaching Administrators Skeptical About Making

Administrator buy-in is hugely important to make making stick across a school. But the good news is that there are ways to get skeptical administrators to change their tune. The key is to go slow, speaking to administrators' needs, goals and priorities, while also countering misconceptions about making.

STEP 1:

Why are administrators skeptical about making?

Skeptical administrators have different reasons for being concerned about making—some valid and some based on misconceptions about what making is. Below are common administrator concerns. Which ones apply to your administrators? Which ones don't apply? Feel free to add any concerns that are unique to your school or district administrators.

COMMON ADMINISTRATOR CONCERN	APPLIES	DOESN'T APPLY
Making is messy and chaotic		
Our school or district doesn't have the money for making		
Making is "flavor of the month." There's no use investing in a fad		
Students don't learn the content they need to learn through making		
Making is a fringe movement without acceptance among mainstream educators		
Students won't achieve high test scores if we take time out of the day for making		
Add your own:		

REFLECT

Are there commonalities among the types of concerns that your administrators have about making? Are they most concerned about the pedagogy behind making, the resources needed to implement making, or the prospects for student achievement?

STEP 2:

What priorities do your administrators have?

Even if an administrator is less-than enthusiastic about making, chances are he or she is excited about *something*. Below is a list of common priorities among administrators. Rank the priorities, in order from most important to your administrators to least important, marking any that are not present among your administrators with an N/A. Feel free to add any priorities that are unique to your school or district.

COMMON ADMINISTRATOR CONCERN	RANKING
Improve student test scores or other measures of student achievement	
Roll out a new program or approach, such as project-based learning or block scheduling	
Improve educational outcomes among specialized groups such as English language learners or special education students	
Build connections between students and the community, including parents and local organizations	
Improve academic offerings in a particular subject area such as STEM	
Offer programming to help students develop social-emotional skills	
Comply with district, state and federal curricular and reporting requirements	
Add your own:	

REFLECT

Look at the rankings that you assigned different administrator priorities. What type of priority is at the top of the list? Does it have to do with student academic achievement, community building, or something else? Are there priorities that you expect will rise to the top of the list in the future?

STEP 3:

How can you appeal to administrator priorities and counter misconceptions?

Advocates for making need to consider skeptical administrators' views and priorities when pitching making activities and practices. The key is to start small. What does this look like in practice? Consider the following examples:

- An instructional coach proposes partnering with a science teacher to develop a single making lesson in the context of a new school-wide project-based learning curriculum.
- A media specialist does a small group project that is not explicitly labeled a "making" project in which she assigns each student responsibility for becoming an expert in a different technology needed to complete the project.
- A tech coordinator attends an important national conference for people in her field. She offers a conference roundup at a faculty meeting in which she highlights the work of other schools and districts to integrate making practices, activities and concepts into their core subjects.

WHAT'S YOUR ACTION PLAN?

Using the examples above as a guide, think about how you plan to advance making concepts and activities with your administrators. What will your first action be?

Now head to page 22 to continue developing your action plan.

Reaching Classroom Teachers Excited About Making

Great news! Having classroom teachers on-board with making widens opportunities for incorporating making in unlikely places and experimenting with different and more sustained types of making. But busy classroom teachers may not always have a good handle on what making is or what it can achieve. Consider the following examples:

- A math teacher is excited to use a class period between units to partner with an instructional coach on offering a making lesson. But he refers to the project as "enrichment" and doesn't see possibilities for making in his day-to-day class.

- A social studies teacher is excited to try out a making lesson as part of her architecture unit. However, in discussions with the tech coordinator, she makes clear that she wants students to follow a prescribed set of directions to construct identical structures rather than following typical making pedagogy.

- A science teacher wants to incorporate making concepts and activities into her classroom. But she is worried about complying with requirements for aligning all of her lessons to academic standards. She says she doesn't believe that making lessons can align to standards.

Thinking about the existing views and needs of classroom teachers upfront can help instructional coaches, makerspace leads, librarians and other non-classroom educators tailor their making proposals in a way that reduces conflict and suggests making as integral to both teachers' and students' success.

> **I support a lot of other classrooms. And so for me, it's bringing making into their curriculum and what they're doing.**
>
> Joe Bertelloni, elementary school librarian in North Clarendon, Vt.

> **We always say to the teachers, 'What topics are you having trouble getting to? Maybe we can build that in.'**
>
> Gerald Aungst, elementary school makerspace lead in Cheltenham, Pa.

STEP 1:

What are the characteristics of the teachers who are most excited about making in your school?

No two classroom teachers are alike. It's useful to consider the unique needs and pedagogical styles of each individual before you suggest an approach to making that will work for him or her. Answering the following questions about classroom teachers who are enthusiasts of making will help you understand who you're partnering with:

QUESTION	YOUR ANSWER
What subject does the teacher teach?	
How is the teacher's instructional time organized (e.g., five periods of 45 minutes a week, once-a-week elective, etc.)?	
Does the teacher have a set curriculum that he or she must use? If so, which one?	
What are the main content topics that the teacher must teach over the course of the year (e.g., angles in math, U.S. geography in social studies)?	
Is the teacher required to align his or her lessons to academic standards? If so, which ones?	
What level of familiarity does the teacher have with making? What making related pedagogies and technologies has he or she used previously?	
What pedagogies and approaches does the teacher typically embrace in his or her teaching (e.g., lecture, group work, hands-on learning, etc.)?	
To what degree does the teacher feel autonomous in his or her practice without the oversight of administrators?	

REFLECT

Look across your responses. What constraints on making do interested teachers in your school face? What are the opportunities for making? You'll want to keep these characteristics in mind as you craft an approach to making that is comfortable for and consistent with the circumstances of the teachers whom you're working with.

STEP 2:

What do your classroom teachers think that making is?

Below are pairs of phrases that classroom teachers may use to describe making. For each pair, circle the choice that better expresses the view toward making that your classroom teachers hold.

DESCRIPTORS FOR MAKING	
Useful in one-off cases	Should be integrated into day-to-day learning
Really about the process	Really about the product
Useful for STEM classes	Useful in all classes
Takes a lot of resources (time, money, support)	Takes few resources (time, money, support)
Connects to our larger school/department goals	Doesn't connect to our larger school/department goals

REFLECT

Look across your responses. Do you notice any patterns? Do interested teachers see making as central to the school or department's goals or teaching activities? What level of resources do teachers believe will support making? Can you spot any misconceptions about making that classroom teachers have?

STEP 3:

How can you support classroom teachers in making by addressing their needs and circumstances while also countering misconceptions?

Advocates for making need to take classroom teachers' views and circumstances into account when pitching making activities and practices. This will certainly make life easier in the short term, reducing conflict and getting quicker buy-in. This strategy of meeting classroom teachers where they are and addressing misconceptions in the process also allows the possibility of building a more comprehensive making program in the future.

Think back to the classroom teachers' views and characteristics you identified. What constraints do teachers face? Do teachers see opportunities for making in a more circumspect way or in a deeper way? Below is a chart showing examples of broad personas of classroom teachers and examples of how an instructional coach or other non-classroom educator can pitch making to that persona in both light and deeper touch ways. Take a look for some ideas about how to broach making with classroom teachers at your school.

PERSONA	LIGHT TOUCH EXAMPLE	DEEPER TOUCH EXAMPLE
A science teacher has a block schedule, is excited to experiment with new approaches and doesn't feel particularly constrained in his curriculum or in aligning his lessons to academic standards	Point the teacher to making lessons on topics he teaches and offer to support with additional resources as needed	Co-develop a full unit using making pedagogies and activities on topics that the science teacher covers over the course of the year, modeling pedagogies and techniques as needed
A tech-phobic social studies teacher must teach directly to her state's academic standards and is most comfortable lecturing. She recently read an article about making and was intrigued	Point the teacher to an example of how a simple, non-tech driven making activity can be aligned to a specific standard that she must cover	Work together on a standards-aligned civics unit in which students engage members of their community on a problem and develop solutions in small teams, learning making concepts along the way
An ELA teacher wants to teach writing around real-world problems and is interested in helping his students develop social-emotional skills such as collaboration and perseverance	Point the teacher to examples of making projects about real-world problems that include journaling, reflection, presentations and other elements that encourage students to write	Work with the teacher to implement a skills-based curriculum or unit by starting with the skills that the teacher wants to develop and highlighting making-based units that develop those skills

WHAT'S YOUR ACTION PLAN?

Using the examples above as a guide, think about how you plan to advance making concepts and activities with interested teachers at your school. What will your first action be?

Now head to page 22 to continue developing your action plan.

Reaching Classroom Teachers Skeptical About Making

Buy-in from classroom teachers is hugely important to make making stick across a school. But the good news is that there are ways to get skeptical classroom teachers to change their tune. The key is to go slow, speaking to teachers' needs, goals and priorities, while countering misconceptions about making.

STEP 1:

Why are classroom teachers skeptical about making?

Skeptical teachers have different reasons for being concerned about making—some valid and some based on misconceptions about what making is. Below are common concerns of teachers. Which ones apply to teachers at your school? Which ones don't apply? Feel free to add any concerns that are unique to classroom teachers in your school.

COMMON TEACHER CONCERN	APPLIES	DOESN'T APPLY
Making is messy and chaotic		
Making doesn't acknowledge my content expertise and the critical role of the teacher		
Making is "flavor of the month." There's no use learning new technologies and techniques that are just a fad		
Students don't learn the content they need to learn through making		
I can't align making lessons to the academic standards I need to cover		
I have too much to do already. I can't add another thing to the mix		
Add your own:		

REFLECT

Are there commonalities among the types of concerns that teachers at your school have about making? Are they most concerned about the pedagogy behind making, the resources needed to implement making, or how making fits into existing structures and demands at your school?

STEP 2:

What are the characteristics of the teachers who are skeptical about making in your school?

No two classroom teachers are alike. Answering the following questions will help you understand skeptical classroom teachers at your school:

QUESTION	YOUR ANSWER
What subject does the teacher teach?	
How is the teacher's instructional time organized (e.g., five periods of 45 minutes a week, once-a-week elective, etc.)?	
Does the teacher have a set curriculum that he or she must use? If so, which one?	
What are the main content topics that the teacher must teach over the course of the year (e.g., angles in math, geography in social studies)?	
Is the teacher required to align his or her lessons to academic standards? If so, which ones?	
What level of familiarity does the teacher have with making? What making related pedagogies and technologies has he or she used previously?	
What pedagogies and approaches does the teacher typically embrace in his or her teaching (e.g., lecture, group work, hands-on learning, etc.)?	
To what degree does the teacher feel autonomous in his or her practice without the oversight of administrators?	

REFLECT

Look across your responses. What are the constraints on making that teachers face? What are the opportunities for making? You'll want to keep these characteristics in mind as you introduce making concepts and activities in ways that are comfortable for and consistent with the circumstances of the teachers whom you're working with.

STEP 3:

How can you appeal to teachers' priorities and counter misconceptions?

Advocates for making need to take skeptical classroom teachers' views and priorities into account when pitching making activities and practices. The key is to take things slow. What does this look like in practice? Consider the following examples:

- An instructional designer proposes partnering with a science teacher to develop a single, one-off making lesson in the context of a new school-wide project-based learning curriculum with clear plans to measure impact and results.

- A media specialist presents at a faculty meeting about a small group project that is not explicitly labeled a "making" project. For the project, she assigns each student responsibility for becoming an expert in a different technology needed to complete the project. She explains how this format could be used to complete standards-aligned lessons around important content areas in different subjects.

- A tech coordinator attends an important national conference for people in her field. She offers a conference roundup at a faculty meeting in which she highlights the work of other schools and districts to integrate making practices, activities and concepts into their core subjects.

> **I don't just work with the students but teaching the teachers how you know what to expect or what they're looking for. It's harder for the teachers than it is for the students.**
>
> Devon Flamm, K-2 instructional coach in Hardin, Mont.

WHAT'S YOUR ACTION PLAN?

Using the examples above as a guide, think about how you plan to advance making concepts and activities with skeptical classroom teachers at your school. What will your first action be?

Now head to page 22 to continue developing your action plan.

What's Next?

You've thought about whom you want to reach and identified an initial action to take. Now, it's time to think about long-term strategy. Here are some guiding principles to keep you on track as you work to mainstream making in your school:

WATCH YOUR LANGUAGE

Language that emphasizes technical know-how or that presents making as inherently messy or chaotic can be a turn-off to overwhelmed administrators or classroom teachers. Put your best foot forward, and give them a reason to say "yes" by speaking in ways that are accessible to them.

FIT MAKING INTO EXISTING NEEDS OR PRIORITIES

Is your school rolling out a new project-based learning program? Is a teacher particularly interested in developing students' social-emotional skills? Well, making can help! Present making as a resource that can help to address an existing need or priority.

CREATE COMMUNITY

It can be lonely to be the only advocate for making in your school or district. Seek out others who are in the same boat, using online forums and conferences as a starting point. Become an ally to the excited administrators and classroom teachers whom you are supporting.

START SMALL

Even an enthusiastic teacher or administrator may get cold feet when he or she hears a plan that involves many class periods, dozens of training hours and the purchase of expensive technologies. Identify a small action, activity or program to get folks' feet wet before diving into large-scale programming. And appreciate that some making programs will need to remain small-scale for some time.

With these principles in mind, you're ready to get started!

Additional Resources on Making

Not sure where to begin with making? Whether it's finding a great activity, securing funding or just understanding what making is and isn't, there are lots of great resources available. This list can help get you started.

LANDSCAPES OF THE MAKER MOVEMENT

- This sponsored guide from EdSurge charts out what's next for maker education. It addresses everything from equity to professional development.
- This literature review looks at the academic work examining "making and tinkering" in education.

HOW-TOS

- This sponsored guide from EdSurge advises readers on how to build their own makerspace. It's chock-full of tips, resources and case studies.
- Digital Promise's Maker Learning Leadership Framework provides extensive resources for school leaders who want to make the case and develop a vision for maker education. It has everything from budgeting information to tips on curricular integration to ideas for assessments.
- This Edutopia article offers advice for using the makerspace for English and humanities instruction.
- This Getting Smart article examines making in a middle school.

RESEARCH-BACKED PRACTICES

- Project Zero, a research organization at the Harvard Graduate School of Education, supports Agency by Design (AbD), an initiative that investigates maker-centered learning.
- The K-12 MakerLab team at Edgerton Center at MIT developed and tested a process for designing maker experiences in the classroom in collaboration with teacher partners.

www.edsurge.com/research

EdSurge Research