Teacher Resource Guide

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MONASH University

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Have you used these videos and resources in your school?

Tell us how you went:

@MonashEducation #MonashSTEM

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Episode 1: Getting started

KEY IDEAS

- What is STEM education?
- Why STEM education is important
- Barriers to teacher engagement in STEM

ABOUT THIS VIDEO

What is STEM education and what does it mean for teachers?

Episode One of this web series is all about getting the conversation about STEM education started. As the guests begin to explore the complexities of STEM education in schools and the potential challenges for teachers, they also shed light on the numerous benefits of including STEM in your school's curriculum.

From finding a common definition to discussing the impacts on teacher's practices, this thought-provoking video drills down to what truly lies at the heart of STEM education, the students.

"STEM education is about enabling children to learn the problem solving skills that are required to build a better future"

Lisa Harvey-Smith

USING THIS VIDEO

ACTIVITY 1

What is STEM education?

After watching this episode, have a discussion with your teachers about what they think STEM education is.

Consider the following questions:

- What do you already know about STEM education?
- What would you like to know about STEM education?
- How could the introduction of STEM into your classroom enrich learning opportunities for your students?
- What are you most worried about when it comes to introducing STEM education?

ACTIVITY 2

What do you want STEM education to look like in your school?

Work with teachers to create a shared vision statement about what STEM education is and looks like in your school.

Consider the following questions:

- Why do we think STEM education is important for our students?
- What does quality STEM education look like in practice?
- How might we engage our students in more relevant and authentic problems?
- How does our STEM vision align to the school's vision?

Episode 2: Diversity

KEY IDEAS

- STEM is for everyone
- Understanding invisible barriers to STEM
- Importance of diversity in STEM

ABOUT THIS VIDEO

Is STEM education for everybody?

Traditionally there have been many barriers for inclusion in the STEM disciplines. However, by its very nature, integrated STEM is an inclusive approach to education. It allows all students an opportunity for success and engagement regardless of their gender or background.

So what are the barriers to changing the stereotypes around STEM careers and the related disciplines?

This episode of 'Let's Talk STEM' delves into the world of diversity and inclusion within the STEM classroom. The guests discuss ideas about the inclusive nature of STEM education and how it is starting to break down stereotypes about who a STEM professional is and what they do.

"STEM is for every student, every day, in every class"

Rachael Lehr

USING THIS VIDEO

ACTIVITY 1

Looking through the lens of gender equity

Review your school's STEM curriculum through the lens of gender equity

Consider the following questions:

- Is there a gender bias in your STEM curriculum?
- Who is your STEM curriculum geared towards?
- What steps can you take to ensure that your STEM curriculum is accessible for all of your students?

ACTIVITY 2

What does success look like in STEM to develop diversity?

Identify what success would look like in your STEM programmes if you want to foster diversity.

Consider the following questions:

- What does success in STEM look like for your students?
- What does success look like for knowledge and skills in STEM?
- What does success in engagement in STEM look like?
- What does success look like for attitudes and values in STEM?
- How can you measure and report developments in attitudes and values?

Episode 3: Diving In

KEY IDEAS

- How to get started
- Navigating student-centred learning
- Assessment in STEM education

ABOUT THIS VIDEO

Is STEM the latest buzz word or is it here to stay?

If you're interested in giving STEM a go but unsure where to start, then this might be the video for you. STEM education does challenge teachers to think differently about the way that they engage and assess their students but it needn't be so daunting. In this episode of 'Let's Talk STEM', our experts explore ideas that might help to give you that start that you need.

Covering ideas such as collaboration and engaging experts, this video is designed to support you in making that big (or small) first step into the world of STEM education.

"It is chaotic, sometimes you're going to fail, and as a teacher that can be quite a big leap of faith"

Deb Corrigan

USING THIS VIDEO

ACTIVITY 1

Student-centred learning in your STEM curriculum

Place posters around your staffroom asking staff to consider and contribute their responses to the below questions.

In a student-centred learning environment….

- What might assessment look like?
- What might planning look like?
- How do we manage the 'chaos'?
- What does learning look like?
- How can we ask the right questions to facilitate student-led learning?

Use the responses to support discussion with teachers to support a shared understanding of the opportunities and challenges related to student-centred learning.

ACTIVITY 2

Quick wins for sustainable change

Starting small is the key to ensuring sustainability when changing teaching practices.

What are some small changes that your teachers can make in their classroom to begin to integrate STEM?

Using the 'Quick Wins' template in the appendix, ask teachers to explore some minor changes that they can make right away to begin on their journey towards STEM integration.

Consider having a teacher celebration session after 2-3 weeks, where teachers openly explain their successes and failures with their quick win goals.

Episode 4: The juggle

KEY IDEAS

- Where's the Engineering?
- STEM integration
- Building a collaborative STEM community vision

ABOUT THIS VIDEO

Is STEM just another thing for teachers to juggle?

There is little doubt that teacher workload is increasing and the idea of adding something new into your curriculum may be overwhelming. This episode addresses the key challenges and misconceptions that relate to inclusion of STEM education at your school.

Our experts address ideas around the inclusion of engineering, collaboration between teachers and address some common misconceptions around STEM.

"STEM is more than just teaching content, it's about giving experiences and allowing students to find their passion"

Kirsten Banks

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ACTIVITY 1

Teaching with the E using the Design Thinking process - The Spider in the Room

Try this challenge with your teachers:

Mr Watson has a huntsman in the corner of his Year 3 classroom. He is very scared of spiders. Using only simple classroom materials how might we help Mr Watson with his problem?

Key engineering features of this problem to look out for:

- Empathy - fully understanding the problem. What's the best solution for both Mr Watson and the spider?
- Is there a more simple solution to this problem? Why can't the spider stay in the room?
- What are the working parts of the design?
- Constraints – What's the best solution with the materials provided? Is it safe for the person and the spider?
- What skills are we using when developing this solution? i.e. critical thinking, creativity, collaboration, capacity to learn from failure

ACTIVITY 2

Layering on the S.T.M.

In Activity 1, what opportunities presented themselves for concepts to be taught from the Mathematics, Science and Technologies curriculum?

Use the curriculum mapping tool in the Appendix to identify relevant teaching, learning and assessment opportunities that could present themselves in this activity.

APPENDIX 1: Quick wins

Quick win (Goal)	How will this be achieved?	Timeframe	Potential hurdles	Potential benefits for students

The spider in the room: Layering on the S.T.M					
	Science			Mathematics	
	Digital Technologies			Design Technologies	

Meet the team

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