CESA STEM Weather Station Challenge

Project Outline

Goal: Middle School students to gain an authentic understanding in the Digital Technologies curriculum through building a weather station to record local climate conditions. Through working in teams, and sharing results and analysis with other schools, students will build capacity in the General Capabilities.

Driving question: Are changing climate conditions important to my local community?

Overview: Through Project Based and STEM Learning, students will build a weather station to record and analyse the climate conditions of their local community, sharing their journey with other participating CESA schools. The project will provide increased teacher capacity and authentic learning experiences through:

- Developing digital technologies skills in coding a microcontroller to record sensory data.
- Gaining perspectives in climate science by collecting, analysing and publishing results.
- Sharing collected data with other participating schools across the CESA network on an online platform to gain a broader perspective of climate trends.
- Build STEM capacity of schools, particularly in regional and low socio- economic areas.
- Assist schools in meeting the key education objectives of the CESA STEM Learning Initiative (see appendix).
- Assist schools in collaborating with industry and other educational service, such as the Bureau of Meteorology.
- Assist teachers in reaching AITSL standards regarding professional learning, use of ICT's and engaging with the professionally teaching networks and community.

Additionally, this project would meet outcomes and could be incorporated into the following CESA Professional Learning school-based projects and workshops: *Implementing the Digital Technologies Curriculum*, *Think, Design and Make* and *Digital Technologies in the Middle Years*.

Learning Documents and Timeline

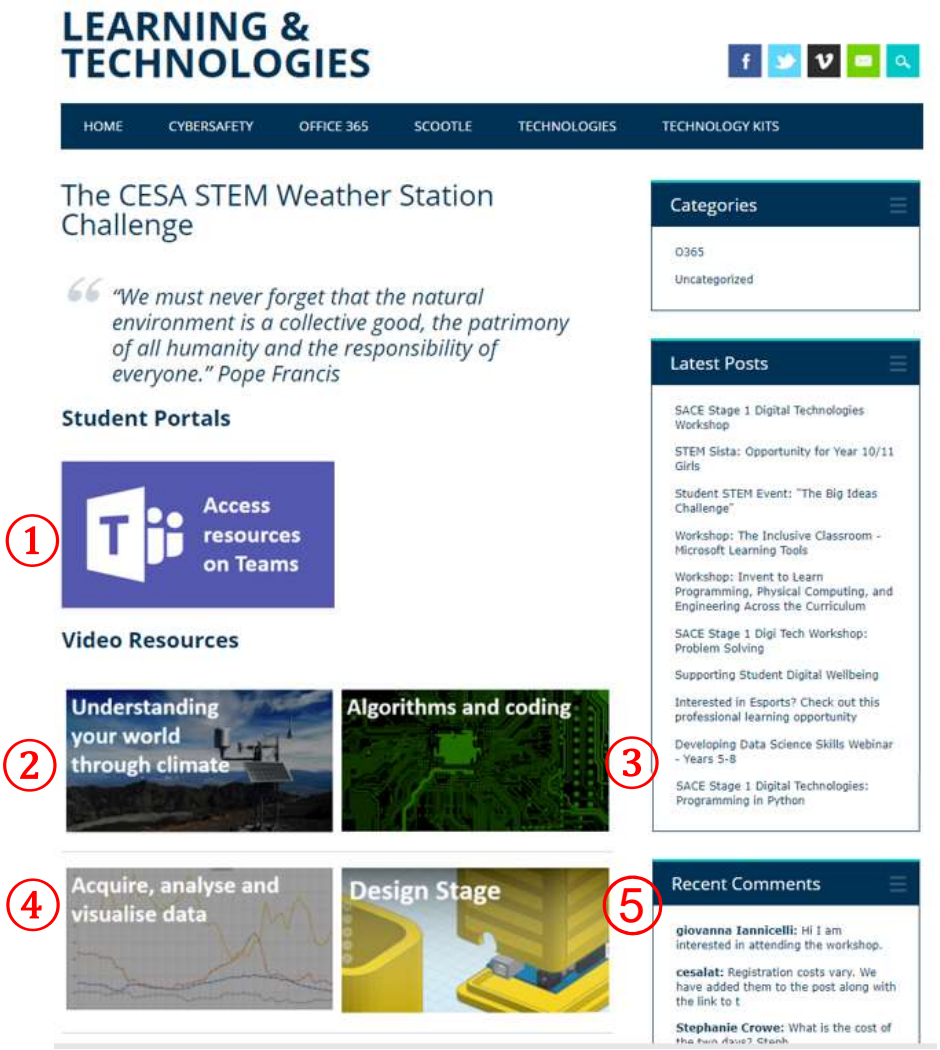
Project Phase			**Recommended Date**
Team Preparation	Team Planning Document		2nd August
Design and Testing	Check in on O365 Teams		12th – 23rd August
	Team Journal		27th September
Data Collection	Check in on O365 Teams		14th - 25th October
Analysis	Weather Report		1st November
	Climate in the community Profile		15th November

Resources:

The CESA Learning and Technology blog will the following resource available to teachers and students:

1. **O365 Teams:** Link for students to the shared O365 Teams to access resources, share their journey, ask for help and submit Milestones.
2. **Understanding your World through climate:** Bureau of Meteorology resources on why recording the weather and climate conditions are important for communities.
3. **Algorithms and coding:** Resources and Tutorial Videos, including from Core Electronics on how to make an Arduino micro-controller Weather Station.
4. **Acquire, analysis and visualise data:** Resources and Tutorial Videos on working with the collected data, including tutorial videos in O365 Excel.
5. **Design Stage:** Tutorial Videos on working through the Design Stage, including Computer Aided Design and 3D Printing tutorials.

https://cesalat.edublogs.org/the-cesa-stem-weather-station-challenge/

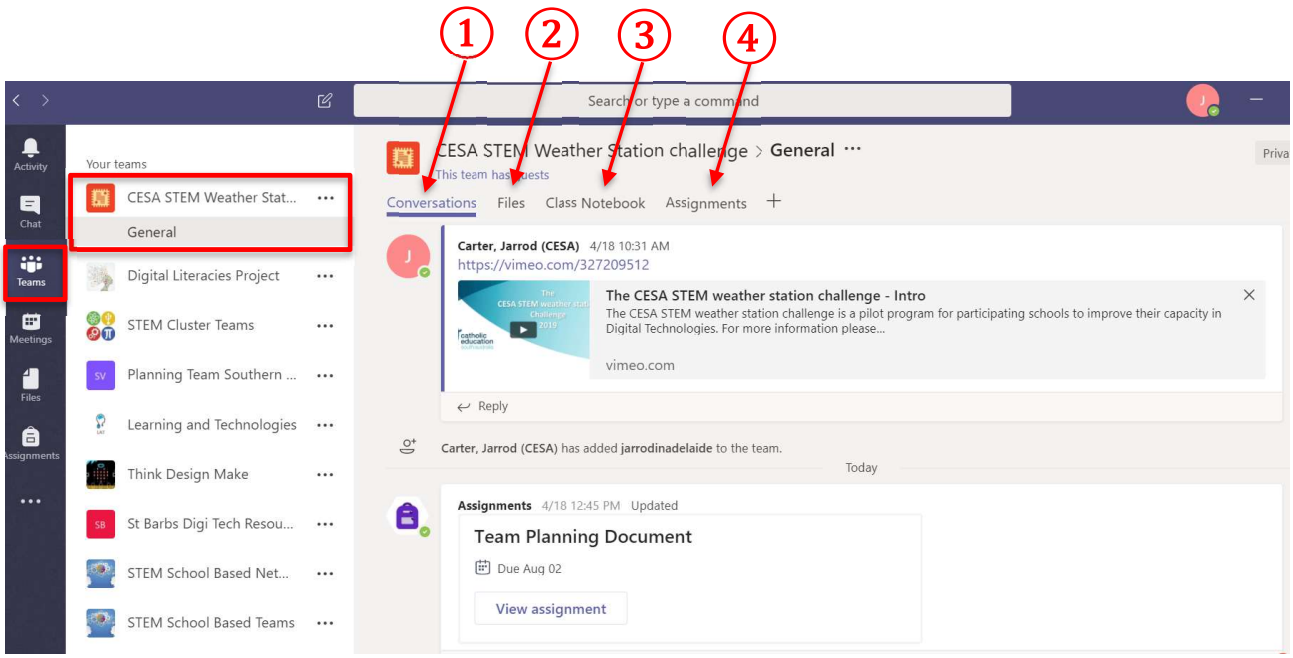


Collaboration:

Through your school's O365 Subscription, the Teams App will be used for your students to view Milestones and collaborate with other participating schools. Teachers and Students from all participating schools will be added to the one Team.

Teachers and students will need to access the following:

1. Conversation tab to see notifications and general announcements. Students can also use this area to pose questions, check in with their progress and see how other schools are progressing.
2. Resources can be added to the File tab. This section will have teacher resources, student templates and allows Teams to upload information to share.
3. Class Notebooks.
4. To keep on track, Milestone assignments have been added to the Assignment tab. Students can upload their milestones in this section.



Team Planning Document

The CESA STEM Weather Station is in open ended project. Student are required to explore explicit Learning Intentions, but they may agency in how they meet these aims. As your Team's mentor, ask each group to read each section and how they will plan for success.

A template for the Team Planning Document can be found in the Files tab of the O365 Team.

Team Journal Document

It is recommended that students follow the Design Thinking process and document each step of the process through the Team Journal. This will allow students to solve the problem of building a Weather Station though five steps of Empathize, Define, Ideate, Prototype and Test.

The Design Thinking process used in the Team Journal document is based on the research of the Stanford University Institute of Design. An Overview of their Design Thinking process can be found in the Resource Folder under the File Tab in the O365 Team.

A template for the Team Planning Document can be found in the Files tab of the O365 Team.

Weather Report

After a successful Weather Station has been created and Data has been collected, Team are asked to analyse their findings through a Weather Report. This report can be in any form; however, it is expected that Teams will:

- Use Software to visual their data in charts, graphs or any other way that summarise data into useful information.
- Share Weather Report to other schools in the O365 Team.

Examples of a Weather Report may be a narrated PowerPoint with visualizations of Data from Excel, or a video presentation with greenscreen.

It is expected that the Weather Report will be based on a month's data, however, this will ultimately be determined by the individual Team's capacity to complete the Weather Station.

Climate in the community Profile

Students are asked to make a conclusion on their project by answering the challenge's Driving Question:

Are changing climate conditions important to my local community?

Students are encouraged to seek key stake holder in the community to understand the impact of climate change. These may be community groups, industry or levels of government. Students are encouraged to:

- Explore the rights and responsibilities of communities and climate change.
- Understand complex ethical interests through a range of competing values, rights, interests.
- Is action required to tackle climate change in your community and what would be the consequences.

This may be presented in any sharable form through the O365 Teams, such as a narrated PowerPoint or video.

Check in's on O365 Teams

The CESA STEM Weather Station challenge is intended The O365 Team is a collaborative tool for either teachers or students to ask questions or guidance to either their CESA Learning and Technology Consultant or other participating schools. The Conservation tab in the O365 Team should be used to post questions so that all participating schools can collaborate or benefit from the shared information.

Two Check In points have been added to the Timeline. As mentors encourage your student Teams to post an update in how they are progressing through the project, the problems and successes they have encountered, with images and videos of their designs.