

# Translating to Demystify Science Project Lesson Plan

**Dr. Lisa Chizek, Iowa State University**

*This material is based upon work supported by the National Science Foundation under Award No.2242763.*

Translating to Demystify is the process of engaging K12 students with scientific reports, papers, or presentations by working scientists, then mentoring the students through a research and creative process as they develop their own understanding of the science topic or process. The student's final project is a video where they explain the goal of the science, how it works, and why it is important to themselves or society.

Here are the steps used to engage the Translating Information to Demystify Advanced Biomufacturing Project Participants:

1 First Meeting with students:

- Explain project and expectations
- Give link to videos to students for them to review as a team and select top 2-3 projects that interest them (as a team) by next meeting
- Schedule a date for the next meeting

Link to Chemurgy 2.0 videos: [https://www.youtube.com/channel/UC6-ZuJRoim5kjHCoX\\_qlgjg/videos](https://www.youtube.com/channel/UC6-ZuJRoim5kjHCoX_qlgjg/videos)

*(We found it much easier to spend time searching through this video link to find the "What is..." videos that fit our project purpose and to put the individual links to those videos in a document for the students. We encourage that approach.)*

2: Second meeting with students

- Students present and explain their team's list of top 2-3 choices for projects from the videos.

3: After meeting with students and getting their top 2-3 choices for projects, contact scientists to set up time for the lab tour and interview. We ask scientists to be ready to give a short presentation about their projects and answer LOTS of questions. Then take project participants to their lab and demonstrate the process they go through for their research, while continuing to answer LOTS of questions. We then make sure they are aware they will continue to be asked LOTS of questions as students work to complete their reimagined videos. For a variety of reasons, we determine follow-up communication needs to be between the teacher/mentor and researchers rather than having project participants reach out individually to researchers.

4: Lab tours and interviews.

[Potential Interview Questions](#)

5: Six weeks of presentation development. Meet with the students on a weekly basis to assess the plans and design for the reimagined videos and to answer any questions as students work to complete their reimagined videos. Guide and supports project participants' work, as well as makes sure students' work is progressing. Teacher/students should reach out to research scientists throughout the video creation process to clarify scientific information and verify accuracy of students' work..

6: Present Work – To classmates or at a public event, students should have the opportunity to share their work, view the projects of other students, and engage in a discussion of what they have learned. Students can create their own rubric for peer evaluation of projects.

## **VIDEO EXPECTATIONS**

Quality and Completeness:

- Is the video well done and of good quality?
- Does the video include a description of the research in an accessible way for the general public?
- Does the video highlight the importance of Advanced Biomanufacturing for Iowa?

**SCIENTIFIC ACCURACY:** The Teacher/Mentor will periodically review the content with the research scientists during the video creation process to clarify information to make sure it is accurate. HS Project Participants will need to tweak their projects, as needed, to make sure of scientific accuracy based on feedback.

## POTENTIAL INTERVIEW QUESTIONS

*This is a basic list of some questions. Students should brainstorm their own before going on their lab visit. The interview needs to be flexible enough that participants should feel free to ask questions that occur to them that help clarify information for them.*

Remind the students: • To ask lots of questions so you understand. It's okay to say you don't understand what that means and ask them to clarify, or explain again.

- What is this research/project all about?
- What is your name(s)? What degree are you working on?
- Why are you interested in doing this research? What drew you to it?
- How did you learn this type of research existed?
- What characteristics or interests should people have if they are interested in doing this research?
- What classes or work or hobbies helped prepare you for doing this work?
- Why is this research important?
- How does this work benefit Iowa?
- Where do you share what you are learning from your research?
- What do you hope or imagine the impact of your research will be in 5 years? Or 10 years? Where do you see yourself in 5 or 10 years?