

# Applied mathematics

## with Professor Jeff Anderson

### Talking points

#### Knowledge

1. How many US college students graduate within the first four years of their degree?
2. What inspired the creation of the first computers?

#### Comprehension

3. How did inventors, scientists and engineers test their early prototypes before mathematical modelling tools existed? How do they use mathematical modelling today to test and improve their designs?
4. How does Jeff's work help students connect mathematics with engineering, careers and everyday life?

#### Application

5. What problems do you notice in your life, community or world that you want to see solved? How might you approach these problems using applied mathematical modelling to find solutions?
6. What steps can you take to learn more about mathematical modelling and build a solid foundation in mathematics?

#### Evaluation

7. What insights from Jeff's career journey resonate with you the most, and how do they influence how you think about your own future?
8. How has Jeff's work changed your understanding of education and what it means to be successful?
9. In what ways could your life, family, friends and community be transformed through deeper learning and problem solving?

#### Creativity

10. Imagine a world where people have the freedom to explore their interests and pursue their dream careers. What would need to change to allow this to happen? How might schools and education change to create a world like this?

### Activity

In this activity, you will use the same applied modelling process that STEM professionals use to solve real-world problems.

#### Step 1: Identify a problem that is meaningful in your life.

Choose a problem that you encounter in your daily life. Examples include staying focused during class, managing your time, improving your sleep, spending more time with friends, balancing school and family responsibilities, or feeling less stressed.

Write a few sentences describing the problem you are trying to solve, when the problem arises and why it matters to you.

#### Step 2: Create an ideal mathematical model

Identify variables of your problem that can be expressed using numbers, such as the number of minutes spent studying, the number minutes spent on your phone, the number of tasks completed, the time you go to bed, the time you wake up, the time spent moving your body, how many new people you talk to during the day, how you feel throughout the day or any other factors that you think matter.

Represent your problem using numbers, an equation, a diagram, a table or anything else that helps you express the problem. This is your ideal mathematical model.

#### Step 3: Find an ideal solution

Use your model to test ideas on paper. Try changing one element or variable and predict what will happen. Write: If I change \_\_\_\_ by \_\_\_\_, then \_\_\_\_ will happen. This prediction is your ideal solution.

#### Step 4: Enact your meaningful solution

Try your idea out in the real world, record your observations and compare your observations with your ideal solution. This could take hours, days, weeks or even months depending on your problem, but be sure to set yourself a time limit.

#### Step 5: Iterate upon your solution

Update your model using what you have learned. Repeat steps 2 to 4 with your improved assumptions and continue refining until you are satisfied with the results.

#### Reflection

- Did your ideal solution successfully predict what happened when you tried it out?
- Has this solution impacted your life meaningfully?
- How could you use this modelling process to improve other areas of your life?

### More resources

- Subscribe to Jeff's YouTube channel featuring videos about maths and education: [youtube.com/@JeffAndersonMath/featured](https://youtube.com/@JeffAndersonMath/featured)
- Explore Jeff's Applied Linear Algebra course to access excellent introductory resources: [appliedlinearalgebra.com/blog/for-students/welcome-to-math-2b](https://appliedlinearalgebra.com/blog/for-students/welcome-to-math-2b)
- Access Applied Linear Algebra laboratory resources on Jeff's website including modelling-based linear algebra curriculum, inexpensive laboratory equipment and more: [appliedlinearalgebra.com/linear-algebra-laboratory-exercises](https://appliedlinearalgebra.com/linear-algebra-laboratory-exercises)
- Use Jeff's Strategic Deep Learning Project to build skills to thrive while learning any STEM subject: [jeffandersonmath.wordpress.com/2024/11/30/jeff-anderson-maths-strategic-deep-learning-project](https://jeffandersonmath.wordpress.com/2024/11/30/jeff-anderson-maths-strategic-deep-learning-project)
- Jeff showcases his students' success stories on his Applied Linear Algebra Wall of Fame: [appliedlinearalgebra.com/wall-of-fame](https://appliedlinearalgebra.com/wall-of-fame)