STEM Fall 2026: Week 8

Complete before the class on Mon, Nov 2nd

STEM Assembly				
- Supplies: Pencil, folder with paper, scientific calculator				2 points
- Books: LifePac Science, CAP Robotics, Mathematics Book				
Is Genesis 8:22 referring to climate or weather? Write a sentence to explain.				3 points
General Sciences				
	Topic	**Reading**	**Exercises**	**Grading**
LifePac 7th Grade Unit 7	Climate: General	pg. 15-19	2.1-2.9	10 points
			2.10-2.17	
		pg. 20-21	2.18-2.30	
			2.01-2.010	
			2.012-2.024	
Robotics				
	Topic	**Reading**	**Exercises**	
Introduction to Robotics Booklet	Robotic Arm	Watch the video from the Boston Dynamics Atlas Robot shop floor and be prepared to discuss in class. Would you prefer to work as an **engineer** *designing* Atlas components OR as a **machinist** *building* Atlas components? Write a sentence to explain.		3 points
		Go to the Forward Kinematics Arm Simulator and set the Base Angle $\theta_1 = 0$ and the Elbow Angle $\theta_2 = 90$. What are the X-Y coordinates of the end effector? Now go to the Inverse Kinematics Arm Simulator and set the Target X-Y coordinates of the end effector to 100mm and 80mm, respectively. What are the resulting robotic arm configuration angles, θ_1 and θ_2? You should get two different answers depending on whether you select "Elbow Up" or "Elbow Down". Write out your answers.		5 points
		Read pg. 62-63 in the Robotics Booklet and be prepared to demonstrate pitch, yaw and roll with your hand. On your robotic arm which degree of freedom does servo S2 provide: pitch, roll or yaw? What about servos S3, S4 & S5?		2 points
		Do NOT bring the miniArm Robotic Arm to the next class. Instead, work on installing the Arduino IDE to a computer or laptop in order to load programs to your robotic arm's Arduino UNO board.		

Science Fair				
Run the science experiment by executing your procedure like we did in class (for better results you may want to use a raw egg instead of a jar). Create a table of measurements with five columns and attach it to the bottom-middle left of your posterboard. **Observation # | Salinity Level | % Floating | Volume Displaced (ml) | Weight (g)**				5 points
For each observation make a sketch or take a picture of the jar or egg floating in the water and attach it to the bottom-middle right of your posterboard.				5 points
Mathematics				
Factorial is a mathematical operation defined as follows: n! = n x (n-1) x (n-2) x ... x 1. For example, 4! = 4 x 3 x 2 x 1 = 24. Use your calculator to calculate n! for all integer values of n between 1 and 10.				3 points
Use your calculator to calculate 1 + 1/1! + 1/2! + ... + 1/10! to five decimal places.				2 points
Bonus +1: Your result is a very special number in mathematics - do you know what it is?				
Bonus +1: Find the factorial button on your calculator and determine the largest value for which you can calculate factorial before your calculator errors out.				