iStronG Post-Survey 2022

Dear Upward Bound Students:

Thank you for participating in iStronG. We now ask you to complete this survey, which will take about 30 minutes to complete. This survey is not a test, and your responses will not affect your academic and program standing. The results will be compared to those from other individuals who have participated in the iStronG curriculum to gain a better picture of its impact and will help us to improve the curriculum.

Your participation in the survey is voluntary. Surveys will be processed someone other than your Upward Bound instructor. Thank you very much for participating.

Questions About You

1. Name

2. Program

- ◯ KU
- ◯ FCEA
- ◯ Univ of GA
- ◯ UMB
- ◯ Rutgers University
- ◯ Weatherford
- ◯ Georgia State University
- ◯ If other, please indicate your institution: _____

3. Are you planning on majoring in Science, Technology, Engineering, or Mathematics in college?

- ◯ Yes
- ◯ No
- ◯ Haven't decided

Questions About iStronG Overall

10. Thinking about the iStronG curriculum as a whole, how enjoyable was it compared to other Upward Bound program curriculums that you have experienced?

- ◯ Much better
- ◯ Somewhat better

- ◯ About the same
- ◯ Somewhat worse
- ◯ Much worse

11. Thinking about the iStronG curriculum as a whole, how valuable was it compared to other Upward Bound program curriculums that you have experienced?

- ◯ Much better
- ◯ Somewhat better
- ◯ About the same
- ◯ Somewhat worse
- ◯ Much worse

12. If you thought it was better or worse than other Upward Bound curriculums, how so?

13. How well did the units in the iStronG curriculum work together?

- ◯ Very well
- ◯ Somewhat well
- ◯ Neutral
- ◯ Somewhat poorly
- ◯ Very poorly

14. Overall, what was the most important thing you learned from iStronG?

15. What was the best part of the iStronG curriculum?

16. What, if anything, didn't work as well as it should have with the iStronG curriculum?

17. How could the iStronG curriculum be improved?

Questions About Climate Change

18. How much do you know about climate change, now that you have completed iStronG?

- ◯ I have almost no knowledge of climate change.
- ◯ I have limited knowledge. I have heard about it, but I am not aware of the facts.
- ◯ I have gathered some information about climate change.
- ◯ I have studied climate change a lot or heard a lot about.
- ◯ I am very knowledgeable about climate change. Other people look to me as a source of knowledge.

19. Do you think that climate change is happening?

- ◯ Yes, I am extremely sure
- ◯ Yes, I am very sure
- ◯ Yes, I am somewhat sure
- ◯ Yes, I am not at all sure
- ◯ No, I am extremely sure
- ◯ No, I am very sure
- ◯ No, I am somewhat sure
- ◯ No, I am not at all sure
- ◯ Don't know

20. Assuming climate change is currently happening, do you think it is:

- ◯ Caused mostly by human activities
- ◯ Caused mostly by natural changes in the environment

- ◯ Caused equally by both
- ◯ Don't know

21. How important is the issue of climate change to you personally?

- ◯ Extremely important
- ◯ Very important
- ◯ Somewhat important
- ◯ Not too important
- ◯ Not at all important

22. How worried are you about climate change?

- ◯ Very worried
- ◯ Somewhat worried
- ◯ Not very worried
- ◯ Not at all worried

23. Please rate how you feel about climate change. Fill in one bubble between each set of bipolar adjectives.

	1 - Most like the left option	2	3	4	5 - Most like the right option
Hopeless (1) to Hopeful (5)	◯	◯	◯	◯	◯
Discouraged (1) to Empowered (5)	◯	◯	◯	◯	◯
Indifferent (1) to Engaged (5)	◯	◯	◯	◯	◯
Not Guilty (1) to Guilty (5)	◯	◯	◯	◯	◯
Calm (1) to Outraged/Angry (5)	◯	◯	◯	◯	◯
Unconcerned (1) to Alarmed (5)	◯	◯	◯	◯	◯
Not afraid at all (1) to Very afraid (5)	◯	◯	◯	◯	◯

24. To what extent have you learned about and discussed climate solutions that can be taken by your family, school, or community?

- ◯ A lot
- ◯ Somewhat
- ◯ A little
- ◯ Not at all

25. To what extent do you think there are actions that you could take now to address climate issues?

- ◯ There are a lot of available actions I could take
- ◯ There are a moderate number of available actions I could take
- ◯ There only a very small number of actions I could take

○ Nothing I could do would make any difference

26. To what extent do you have an interest in making educational choices that will make you better prepared to work on solutions to climate issues?

○ A lot

○ Somewhat

○ A little

○ Not at all

27. How likely are you to do the following?

	Very likely	Somewhat likely	Unlikely	Will not do
Take action to reduce your personal carbon footprint (e.g., ride your bike more, turn off lights when they are not needed, purchase renewable energy sources if available from your utility, etc.).	○	○	○	○
Discuss climate change with your family and friends.	○	○	○	○
Discuss climate change with your peers.	○	○	○	○
Take some form of political action (e.g., write to your government officials, sign a petition, participate in a town hall meeting or rally) in support of climate change policy.	○	○	○	○

28. Assuming climate change is happening, what are its expected impacts over the next few decades?

	Extremely likely	Somewhat likely	Somewhat unlikely	Not likely	I don't know
Increased temperatures globally.	○	○	○	○	○
Decreased temperatures globally.	○	○	○	○	○
An overall increase in clean, potable water globally.	○	○	○	○	○
An overall decrease in clean, potable water globally.	○	○	○	○	○
Increased incidence and intensity of heat waves.	○	○	○	○	○
Increased rates of extinction of plant and animal species.	○	○	○	○	○
An overall decrease in global food production.	○	○	○	○	○
An overall increase in global food production.	○	○	○	○	○
Increased global sea level.	○	○	○	○	○
Increased intensity of storms across many regions.	○	○	○	○	○
No changes beyond natural variability in	○	○	○	○	○

weather.	

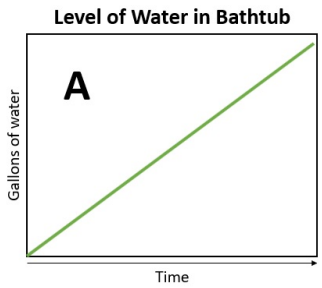
29. To what extent do you agree with the following statements?

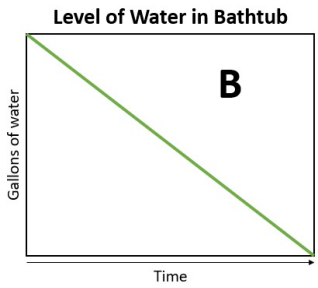
	Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree
I am interested in climate and sustainability.	○	○	○	○	○
I am interested in taking courses related to climate and sustainability.	○	○	○	○	○
I am interested in pursuing a minor or major related to climate and sustainability.	○	○	○	○	○
I am interested in pursuing a career related to climate and sustainability.	○	○	○	○	○
I am interested in, or already have, joined a local, state, or national environmental club or organization.	○	○	○	○	○
In order for a society to be sustainable, it should be able to meet the needs of the present generation without jeopardizing the ability of future generations to meet their own needs.	○	○	○	○	○
Social, economic, and environmental systems are interconnected and interdependent.	○	○	○	○	○
With the current rate of heat-trapping/ greenhouse gas emissions, CO2 levels will continue to increase because emission rates are higher than the rate at which CO2 is being taken out of the atmosphere.	○	○	○	○	○

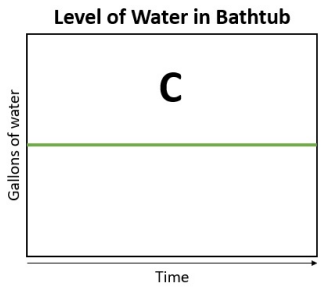
Questions about Systems

Before answering the following three questions, imagine a bathtub with a faucet and a drain. The faucet adds water to the tub, where water accumulates, and the drain empties water from the tub. Both the faucet and the drain can be adjusted to allow different rates of water flow.

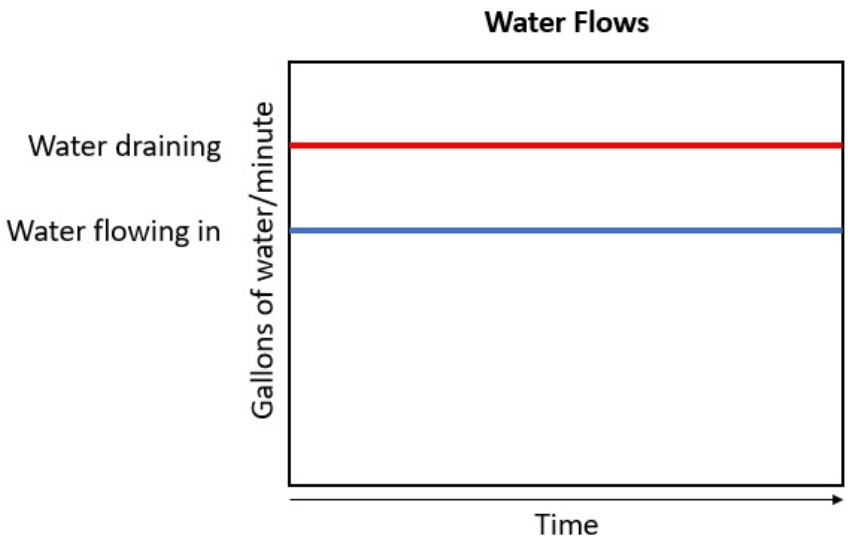
For the three questions, the graph shows the water flow rates of both the faucet (in blue) and drain (in red). Given what you know about the relationship between these two flows and the level of water in the bathtub, match each flow graph with the corresponding "Level of Water in Bathtub" graph below to show how you think the water in the bathtub will change over time (green line).





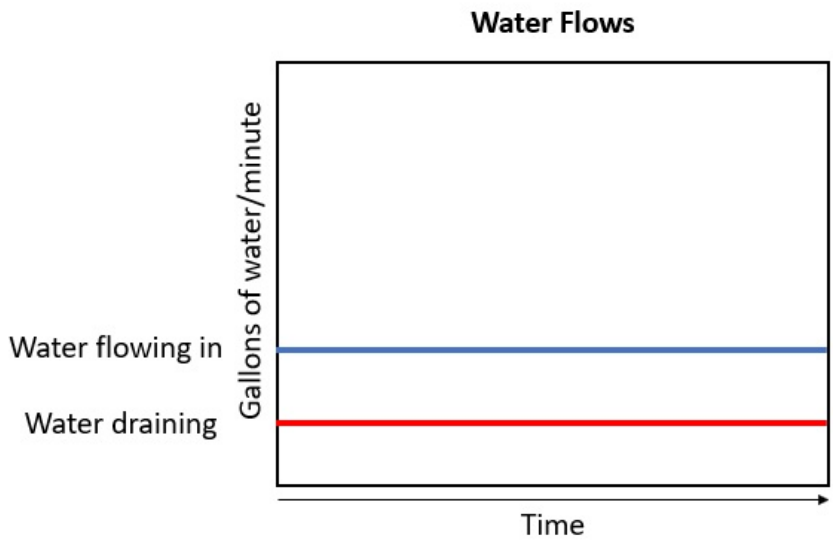


18. Faucet and Drain 1



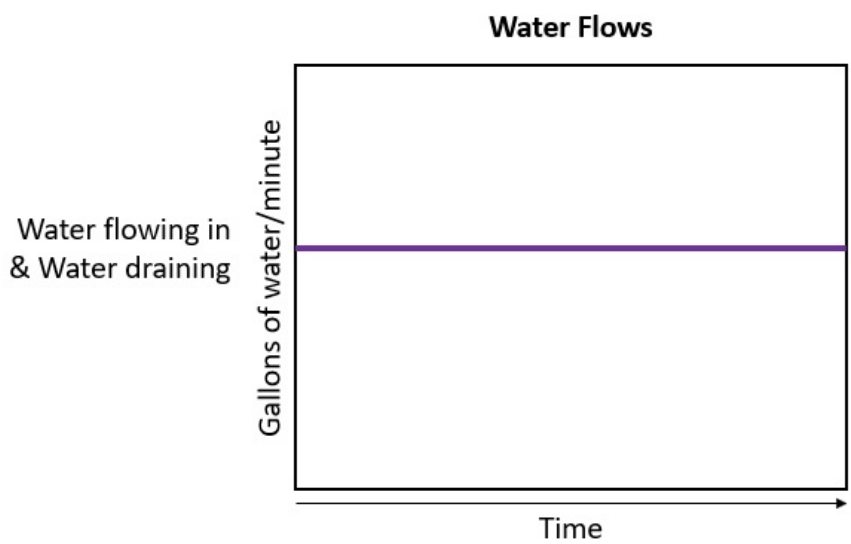
○ A
○ B
○ C

19. Faucet and Drain 2



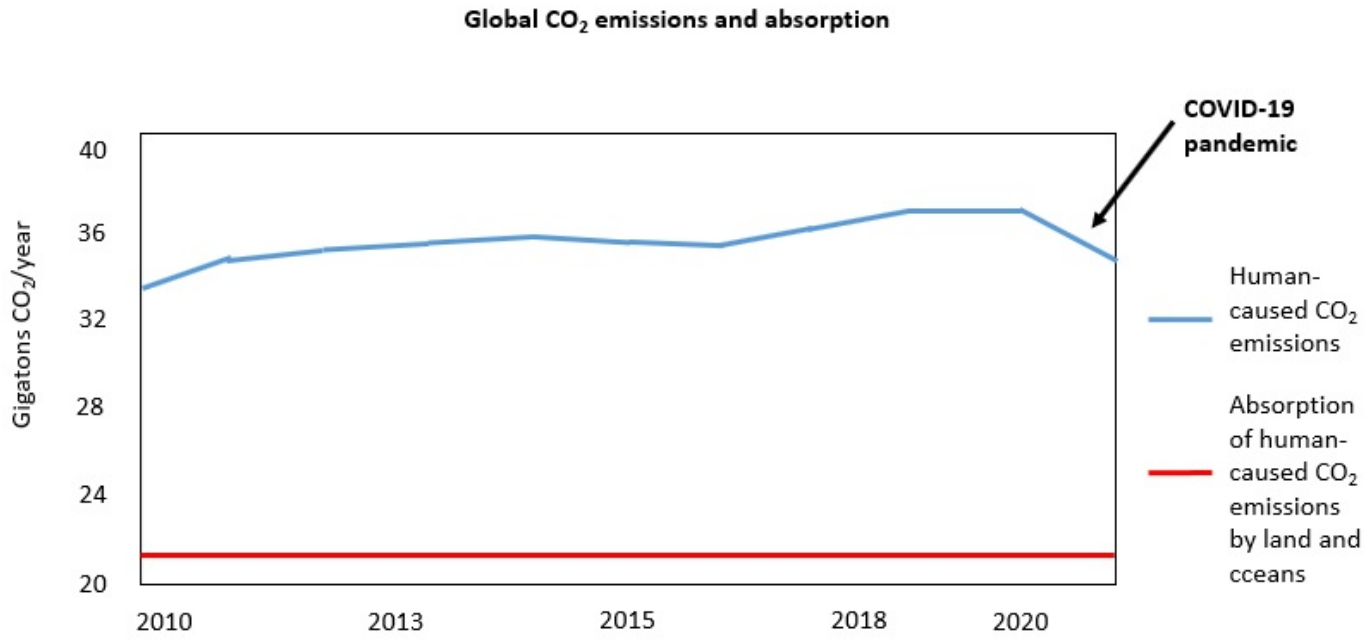
○ A
○ B
○ C

20. Faucet and Drain 3



○ A
○ B
○ C

The graph below displays *human-caused CO_2 emissions* and *the absorption of human-caused CO_2 emissions by land and oceans* from the years 2010 – 2020. As you can see towards the end of the timeline, global CO_2 emissions fell in 2020 due to reduced travel and economic activity during the COVID-19 pandemic.



21. Assuming that the absorption of human-caused CO_2 emissions by land and oceans remained the same (shown in red), did this decline in human-caused CO_2 emissions cause a decrease in the amount of CO_2 in the atmosphere?

- ○ Yes
- ○ No

22. Why or why not?

23. Currently, climate-polluting fossil fuels power most of the global electricity supply. Every year about 3% of power plants become too old and need to be shut down. At the same time, new power plants equivalent to about 6% of the global supply are added every year. If 50% of all new power plants rely on clean energy such as solar or wind, how do you expect the global electricity supply to change over the next ten years?

- ○ The proportion of clean energy and fossil fuel-based energy will stay the same over time.
- ○ The proportion of clean energy will grow, but but the amount of fossil fuel-based energy supply will stay the same.
- ○ The proportion of clean energy will decline, while the proportion of fossil fuel-based energy will grow over time.

○ Not enough information.

24. You might have studied the concepts of systems and systems thinking in your classes, for example, when you studied the human body or the solar system. The following questions concern certain concepts that can apply to multiple systems. Thinking generally about systems, which of the following statements are true or false?

	True	False
Systems that are in equilibrium never change over time.	○	○
All systems have function or purpose and in reality no single part of a system can achieve anything alone.	○	○
Each system has discrete pieces within the system that are called elements. These elements must be material objects.	○	○
Models of systems are always limited and imperfect representations.	○	○
To be an identified system there must be more than one element that is interconnected with another element in an organized way.	○	○
System dynamics has shown that cause and effect are always closely related in time.	○	○
If the in-flow to a system is greater than the out-flow over time, then the stock may or may not increase over time.	○	○
In systems modeling, a "stock" is often referred to as the "noun" and the "flow" as the "verb." Although the flow rates usually determine the amount of the stock, sometimes the stock amount may change without a change in the flow.	○	○
System dynamics research has shown that small actions, even those that leverage existing systems structures, cannot result in large impacts.	○	○
A system's structure generates its behavior.	○	○
Because of the known facts about accumulations over time, a reduction in the in-flow should generate immediate change in the stock.	○	○
Systems modeling can be a tool to allow an increase in empathetic inquiry or changing one's perspective to stand in another's shoes.	○	○
In systems language, a Reinforcing Loop counters change in one direction with change in the opposite direction.	○	○
Systems thinkers speak of Unintended Consequences as unplanned and typically undesirable side effects of well-meaning intentions and actions, often occurring after a time delay.	○	○

The next series of questions are about facts that scientists have found in their study of the Climate. These are adapted from the NASA Earth Observing Website, the Penn State CLEAN project, and Project Drawdown.

25. What proportion of climate scientists has concluded that humans are the primary driver of today's climate warming?

○ 34 percent

○ 59 percent

○ 76 percent

○ 97 percent

26. If we stopped burning fossil fuels today, what would happen to the climate?

- ○ Earth's average temperature would immediately cool.
- ○ Temperatures would slowly cool over the next 5 years.
- ○ Temperatures would fluctuate, but stay the same on average
- ○ Temperatures would continue to rise for at least 10 years, and then would level off..

27. Which country has emitted the most CO_2 over time? In other words, which nation has the most responsibility for the greenhouse gases that are currently residing in the atmosphere?

- ○ China
- ○ USA
- ○ Russia
- ○ Saudi Arabia
- ○ European Union

28. How has the global average temperature changed since the Industrial Revolution?

- ○ Cooler by 0.1 degree C (0.2 degree F)
- ○ The temperature has gone up and down, but remains overall the same
- ○ Warmer by 0.1 degree C (0.2 degree F)
- ○ Warmer by more than 1 degree C (2.07 degrees F)
- ○ Warmer by almost 2 degrees C (3.6 degrees F)

29. Modern instruments have only been around for a little over 100 years. So how do we know what greenhouse gas concentrations (and temperature) were in Earth's past?

- ○ Air bubbles trapped in ice cores provide detailed records of what the atmosphere was like in the past.
- ○ Examining organisms in marine sediments can tell us what the temperature was like in the past.
- ○ Pollen in lake beds shows what plant species have lived there during different times. Different plant populations are associated with different types of climates.
- ○ Tree rings show the history of drought, fire, and other environmental variations.
- ○ Glacial moraines show when and where previous episodes of glaciation occurred.
- ○ All of the above

30. How does the rate of today's warming compare to previous episodes of rapid climate change on Earth?

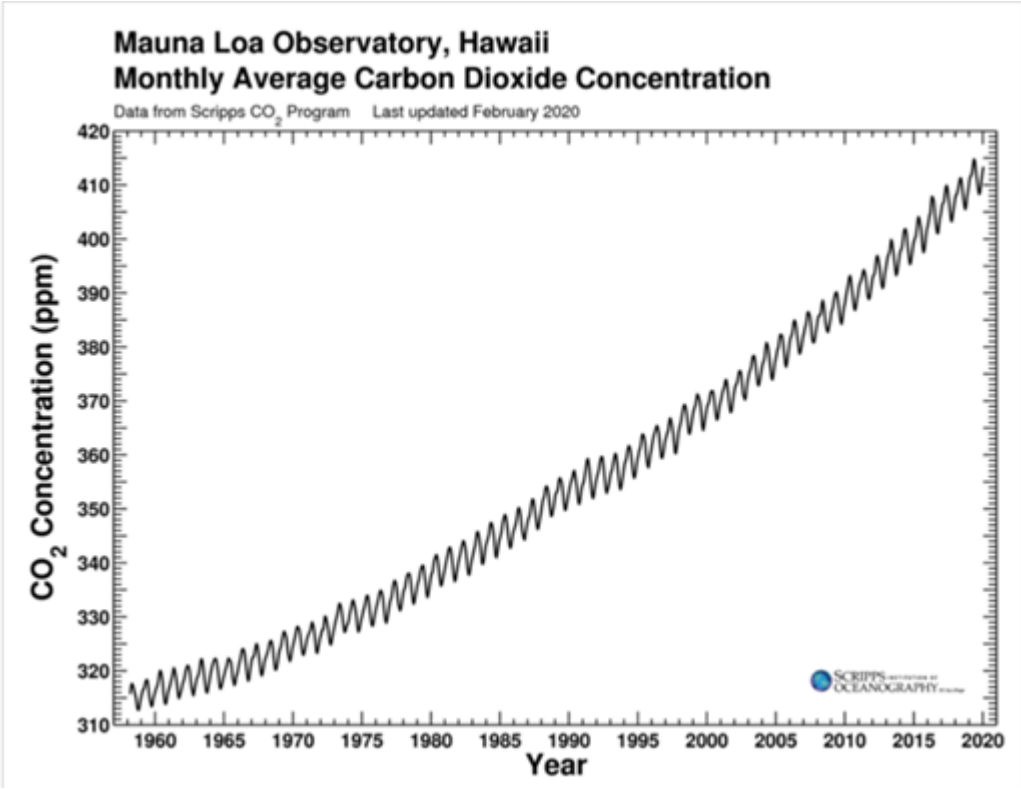
- ○ Today's climate warming is about as fast as the temperature swings that have happened in Earth's past.
- ○ Past changes in the climate have been faster than the changes we're seeing today.
- ○ Today, the Earth's climate is changing much faster than it has changed in the past.

31. How much has CO_2 in the atmosphere increased since the Industrial Revolution? In the 10,000 years before the Industrial Revolution in 1751, carbon dioxide levels rose less than 1 percent. Since then, they've risen by:

- ○ 11 percent
- ○ 46 percent
- ○ 62 percent

32. When was the last time in Earth's history that CO_2 was as high as it is now?

- ○ This is the highest it's ever been
- ○ CO2 was at least this high during the warm periods between the ice ages
- ○ CO2 has not been this high for almost one million years.
- ○ The last time CO2 was this high was 3 million years ago.



33. This is a graph of carbon dioxide in Earth's atmosphere, measured since 1958. There are two patterns in this data. One is the dramatic increase over time and the other is the annual up and down seasonal variation. What is the cause of the seasonal variation?

- ○ People use more energy in the winter
- ○ Plants take up more CO2 during the Northern Hemisphere summer
- ○ Oil refineries are shut down periodically in the summer
- ○ During the Southern hemisphere's winter, strong winds circulate CO2 down into the Southern Hemisphere

34. List five actions that can be taken to avoid worst-case climate change scenarios.

35. A popular resource among climate scientists entitled Project Drawdown calculates and ranks the positive impacts of currently-available global climate solutions. Select the statement below that expresses a widely held belief about solving climate change:

- ○ If we only reduced food waste, ate plant-based diets, better managed refrigerants, restored tropical forests, and increased the use of wind turbines, we would meet international climate goals.
- ○ While some solutions have a stronger climate impact, we need to implement a combination of many solutions in order to meet international climate goals.
- ○ We could meet international climate goals if each person made individual lifestyle changes to reduce their carbon footprint.
- ○ If only China, India, and other developing countries reduce their emissions, we would meet international climate goals.

36. The primary source of energy in the Earth's Climate is

- ○ Industrial activity
- ○ Geothermal activity
- ○ The sun
- ○ Weather

37. Burning fossil fuels is the major source of human induced climate change. What is the second largest source?

- ○ Deforestation
- ○ Volcanic Activity
- ○ Cow Belching

38. Most scientists believe

- ○ There is more than enough energy from the sun to power the entire USA.
- ○ While solar power is useful it cannot power large areas.
- ○ The price of solar energy is likely to remain too expensive to use.
- ○ In this country we already use all of the available solar energy.

39. Please respond as honestly as possible. There are no right or wrong answers!

	Strongly agree	Agree	Not certain	Disagree	Strongly disagree
I'm doing a good job of learning in school.	○	○	○	○	○
I often feel like I have little control over what happens to me in school.	○	○	○	○	○
It doesn't matter whether or not I learned from an assignment, as long as I get a good grade on it.	○	○	○	○	○
In my opinion, what is taught in my classes is not worth learning.	○	○	○	○	○
I often worry that I am not very good at school.	○	○	○	○	○
I sometimes get to make choices about what and how I learn.	○	○	○	○	○
The only reason I try to do well at school is to please my teachers or parents.	○	○	○	○	○
Most of what I'm learning at school is important to me.	○	○	○	○	○

At times I feel that I'm not good at anything at school.	○	○	○	○	○
When I try hard, I do well on my schoolwork.	○	○	○	○	○
I try to learn as much from my schoolwork as I can.	○	○	○	○	○
School is usually boring.	○	○	○	○	○
I feel I always need help with difficult schoolwork.	○	○	○	○	○
It doesn't matter how much effort I put into my schoolwork, because I get the same grades whether I try hard or not.	○	○	○	○	○
I do not want to learn a lot of different things in school. I just want to learn what I need to get a good job.	○	○	○	○	○
I'm usually interested in what I'm learning at school.	○	○	○	○	○
I feel good about my ability to do schoolwork.	○	○	○	○	○
At school, I have many questions I don't get to ask.	○	○	○	○	○
I do my schoolwork so my teachers or parents don't get mad at me.	○	○	○	○	○
Going to school is a waste of time.	○	○	○	○	○

Outcomes of Participation

39. To what extent have the following changed because of your participation in iStronG?

	Increased a lot	Increased a little	No change, stayed high	No change, stayed low	Increased a little	Increased a lot
Knowledge about climate change and sustainability	○	○	○	○	○	○
Understanding of what it will take to address climate change and sustainability issues	○	○	○	○	○	○
Desire to learn more about leading or effecting change in the area of climate change	○	○	○	○	○	○
Sense that you have the power to help address climate change and sustainability	○	○	○	○	○	○
Motivation to take action to address climate change and sustainability	○	○	○	○	○	○
Knowledge about Green STEM	○	○	○	○	○	○
Knowledge about the jobs available in your local area related to Green STEM	○	○	○	○	○	○
Interest in pursuing a major in college that is related to Green STEM	○	○	○	○	○	○
Interest in having a career in Green STEM	○	○	○	○	○	○

40. How has participation in iStronG affected your desire to learn more about the following?

	More interested	No change	Less interested
The science of climate change	○	○	○
Potential solutions for mitigating the effects of climate change	○	○	○
Politics as it relates to climate change	○	○	○
Economics as it relates to climate change	○	○	○
Energy policies as they relate to climate change	○	○	○