

Supplementary Material

Table S2. Exemplars of each argument component from plastic pollution task, which were added to the codebook referencing while coding the wind energy and water conservation tasks.

<i>Code</i>	<i>Indicators</i>	<i>Exemplars (plastic pollution task)</i>	<i>Notes</i>
<i>Claim</i>	Gives a yes or no response to multiple-choice question regarding given alternative		
<i>Reasons</i>	Proposition supporting the final claim (a claim needs to be stated to have a reason). May include reiterating a reason given from question text, initiating an independent line of argument, or offering evidence in the form of specific cases, examples, statistics, and/or citations.	We should ban single-use plastics because of their detrimental effect on the environment.	
		We should ban single-use plastics in the United States because the damage they cause is practically irreversible.	
		I understand that it is a problem but if we ban ALL single use plastic, there will be something else that we turn to to use more of and then that will become a problem. Though single use plastics are a huge problem, there has to be another way decrease the amount rather than eliminating ALL of it. Sometimes there is no choice other than using single use plastics.	
		I believe that single-use plastics should not be banned. As the issue paragraph has stated, it poses a major threat against wildlife since it never ends up getting recycled or incinerated. That is the problem, there is not enough education on how and what humans should be recycling. Some days I don't even know if I should recycle a certain item because as a kid, I can only remember watching one educational video on how to recycle.	
<i>Counterargument</i>	Reason on the other side of the issue than the final claim, for example, a consequence of opposite	I understand that it is a problem but if we ban ALL single use plastic, there will be something else that we turn to to use more of and then that will become a problem. Though single	Claim is that plastics should not be banned, counterargument is that they are a huge problem

	value. Counterarguments require that students have a claim (rather than selecting "I don't know")	use plastics are a huge problem , there has to be another way decrease the amount rather than eliminating ALL of it. Sometimes there is no choice other than using single use plastics.	
		We should ban single-use plastics because of their detrimental effect on the environment....Much like how we need to make the shift towards owning grocery bags and bringing them with us to go shopping, we also need to shift how we use straws and cups by always bringing around our own.... Yes, there is a claim to be made about the challenge this poses for people who have less access to these more expensive items , however, the costs will soon outweigh the benefits....	Claim is that plastics should be banned, counterargument is that plastics are inexpensive and accessible
<i>Basic refutation</i>	An argument for why a counterargument is flawed or less applicable, not integrated in that it does not address a premise. Acknowledges and evaluates counterarguments, but ultimately rejects them rather than integrating them into the argument. Argues that the conclusion of the counterargument is false.	We should ban single use plastics because there are so many different ways we can make plastics or other containers that single-use plastics are not needed. They do not provide anything positive to our world except possibly money to big corporations, but they can switch their focus on to new things.	Claim is ban single-use plastics, counterargument is that they are profitable for large corporations, but this is refuted because corporations can “switch their focus to new things.” This is a basic refutation because it acknowledges the counterargument of profit, evaluates the argument in terms of how corporations can make money, and decides that it is a flawed counterargument because corporations could switch their focus.
		While the United States doing our part to cut back on plastic pollution would help the overall picture, most of the plastic waste on Earth comes from other countries that don't have waste management facilities. With that being said, this would just cause a rift in society while not really helping the overarching issue, which is global plastic pollution, not American plastic pollution.	Claim is do not ban single-use plastics, counterargument is that cutting back on plastic pollution in the US would help the overall picture, refutation is that other countries are larger sources of plastic pollution than the US. This

			is a basic refutation because it acknowledges the counterargument that the US could stand to cut back on plastic pollution, evaluates the argument in terms of global plastic pollution, and ultimately rejects the counterargument because the US isn't a major source of plastic waste.
Integrated refutation (includes design claim and weighing refutations)	<p>Integrated refutations may be either <i>design claims</i> or <i>weighing refutations</i>, as described below.</p> <p>Design claim: Addresses a counterargument by designing a solution. Would include any supporting reasons. (Counterargument could be implicit if it is a premise explicitly in the question stem's text). The proposed solution preserves the benefits of an alternative while reducing the negative consequences of a counterargument. The design claim should clearly state how the proposed solution can mitigate negative consequences of counterargument.</p>	<p>I don't believe that it would make sense to ban all single use plastic. After all, it isn't the plastic going into the waterways by itself. It is people polluting the waterways and environment. I think that there should be harsher penalties for people who pollute the environment and waterways.</p>	<p>Claim is do not ban single-use plastics because it wouldn't work and counterargument is that plastic pollutes the waterways and environments. The design claim integrates that counterargument by suggesting a solution, which is harsher penalties for pollution. This preserves the benefit of keeping single-use plastics as an option, while also mitigating the negative consequences of plastic on the environment.</p>
		<p>I do believe that single-use plastics should be controlled, but I do not believe an all-out ban is practical or feasible. Too many companies make use of single-use plastic and are dependent on them, so the switch to find alternatives and change the way these companies operate would be far too impractical. I think recycling becoming mandatory would be a lot better of an option. It's a situation very similar to the use of metric units in the united states; the imperial system is WAY too far</p>	<p>Claim is do not bans single-use plastics because a ban is not feasible or practical. Counterargument is that plastics should be controlled. This participant is making a design claim - mandatory recycling or reusable materials incentive</p>

	<p>Weighing: A refutation (i.e., negative assessment of an argument) that weighs something against something else. Weighing could include moral values, amounts, or probabilities. (Counterargument could be implicit if it is a premise explicitly in the question stem's text).</p>	<p>integrated to do anything about changing it. [Other solutions are] require recycling of plastics or providing some sort of benefit/program encouraging people to use reusable solutions instead of single-use plastics. [These solutions are] better; they are much more easily integrated and supported than the banning of single-use plastics.</p>	<p>program - and weighing the arguments of practicality vs. the impact of plastics to ultimately arrive at the design claim. This refutation reduces the importance of the need to control plastics compared to the feasibility of implementing a ban on single-use plastics.</p>
	<p>Design claims and weighing refutations may be considered <i>implicit</i> if they address a counterargument that is a premise explicitly stated in the question's text; when they address a clearly identifiable counterargument, they are considered <i>explicit</i>.</p>	<p>I think we should ban them because of the abundance that they take up in total plastic pollution. Single-use plastics can be replaced with multi-use/reusable options, biodegradable options, or more efficient options when it comes to recycling. [...] I think that all three can be implemented together. Banning single-use plastics might be the most immediately effective, but also the one that might face the most push back. The other two are less controversial and easily feasible for people to adopt into their lives' without much change.</p>	<p>Claim is ban single-use plastics because of the abundance they take up in plastic pollution. Counterargument is banning might face pushback. This participant is weighing the benefit of a ban vs. the accompanying controversy and potential lack of feasibility. This refutation reduces the importance of the pushback by stating that banning single-use plastics could be the most immediately effective solution. This also reduces the importance of the abundance of plastic pollution by stating that less controversial and more feasible solutions should be considered.</p>