

Forms of Justification when Reading Scientific Arguments

Answer Keys

Question	Assessment			
	Earthquake 1	Earthquake 2	Volcano 1	Volcano 2
1	B	B	B	B
2	C	C	B	B
3	RUBRIC	RUBRIC	RUBRIC	RUBRIC

Rubrics: Constructed Response Items
Reading Forms of Justification

Earthquake 1: Tamara and Jamal

Score	Description	Sample Student Response
3 Compare	Student makes a correct choice and critiques the justifications by comparing the forms of justifications used in both arguments (e.g. one uses empirical measurements and observations, but the other only uses less important (authority, plausible explanation).	<p>RJI B T11 S2 <i>Tamara's argument is stronger because it is supported with scientific facts from an investigation. Jamal's argument is not as strong because a personal experience is not always as reliable as facts from a real investigation.</i></p> <p>RJI A T11 S20 <i>I think Tamara's idea is better because she has data about earthquakes. I think Jamal's idea is not good because it doesn't have data.</i></p> <p>RJI A T11 S18 <i>Tamara because she compares two earthquakes and then gave the exact time. Jamal said he had felt two earthquakes so maybe he took a guess how long it took.</i></p>
2 Correct Choice and Identification	Student makes a correct choice and critiques the justification by identifying the correct form of justification used in one of the arguments.	<p>RJI A T11 S24 <i>Tamara's because she added how the earthquake was and it wasn't a personal story.</i></p> <p>RJI D T11 S24 <i>Tamara's is better because it tells you how long they last. It tells you how strong and where they happened.</i></p> <p>RJI A T11 S21 <i>Tamara's argument because she explained what the destruction amount was and how long it was going on</i></p>
1 Correct Choice	Student makes a correct choice, but uses less important justifications to identify a stronger argument.	<p>RJI A T11 S31 <i>Tamara because she has more details</i></p> <p>RJI B T11 S8 <i>Tamara's argument is stronger than Jamal's.</i></p> <p>RJI D T11 S23 <i>Tamara's is the best because it gives us more information</i></p> <p>RJI A T11 S17 <i>Tamara's because her information is more accurate</i></p>
0 No Choice or Incorrect Choice	<p>0.1 No choice</p> <p>0.2 Wrong choice plus no reason (X's argument is better)</p> <p>0.3 Wrong choice plus wrong reason (X's argument is better because he/she gave a lot of evidence)</p> <p>0.4 Wrong choice plus right reason (X's argument is better because he/she asked a scientist)</p>	<p>RJI A T11 S27 <i>I think Jamal supported his claim better than Tamara because he backed it up with a personal experience.</i></p> <p>RJI A T11 S16 <i>Jamal's argument explains better because he gives us examples of why some earthquakes have more destructive power than others</i></p> <p>RJI D T11 S21 <i>Jamal's argument was better because it was easy to understand</i></p>

Earthquakes 2: Carrie and Eric

Score	Description	Sample Student Response
3 Compare	Student makes a correct choice and critiques the justifications by comparing the forms of justifications used in both arguments (e.g. one uses empirical measurements and observations, but the other only uses less important (authority, plausible explanation).	<p>RJ2 D T13 S10 <i>I think Eric supports his argument because he has evidence of how many earthquakes there are and how much energy it takes. And he has more information on how much earthquakes there are etc. Carrie's argument is more of her own personal view of earthquakes and Eric's argument is more about how much there is earthquakes in a year.</i></p> <p>RJ2 C T17 S11 <i>Eric supported the argument better. He used data about earthquakes from prior years to support his claim, whereas Carrie didn't use any data, but just told a story.</i></p> <p>RJ2 C T17 S5 <i>Eric's argument is better because he uses actual measurements unlike Carrie who used her own opinion.</i></p> <p>RJ2 C T17 S4 <i>Eric's argument is better. He used scientific facts and statistics to prove his claim. Carrie used personal experience, which is good, but not as strong as facts and statistics. If she really wanted to include a personal story, she should have included it with facts for a stronger claim.</i></p>
2 Correct Choice and Identification	Student makes a correct choice and critiques the justification by identifying the correct form of justification used in one of the arguments.	<p>RJ2 A T13 S8 <i>Eric better supports this argument because he gives the reader the approximate earthquake number along with the appropriate strength. He tells how there are a lot more small strength earthquakes than there are large earthquakes. Carrie didn't have any useful information.</i></p> <p>RJ2 A T17 S10 <i>Eric because he has added data and explained his claim.</i></p> <p>RJ2 A T17 S4 <i>Eric's argument was better supported because his argument was based on facts while Carrie's was based on personal experience.</i></p> <p>RJ2 A T17 S2 <i>Eric better supports his argument. Eric's argument is better supported because he stated measurements from investigations and used them to come up with a conclusion.</i></p> <p>RJ2 A T17 S6 <i>Eric has a better argument, as he has scientific fact instead of a theory based on a life event.</i></p>
1 Correct Choice	Student makes a correct choice, but uses less important justifications to identify a stronger argument.	<p>RJ2 A T13 S10 <i>Eric because he tells a lot of stuff about his argument</i></p> <p>RJ2 A T13 S9 <i>Eric's because it has more examples and scientific reasons</i></p> <p>RJ2 A T17 S1 <i>Eric's argument because he uses facts</i></p>
0 No Choice or Incorrect Choice	<p>0.1 No choice</p> <p>0.2 Wrong choice plus no reason (X's argument is better)</p> <p>0.3 Wrong choice plus wrong reason (X's argument is better because he/she gave a lot of evidence)</p> <p>0.4 Wrong choice plus right reason</p>	<p>RJ2 A T17 S20 <i>Carrie had better support because she experienced the actual event.</i></p> <p>RJ2 A T17 S25 <i>Carrie's argument better states the earthquakes that release more energy happened less often than Eric's argument.</i></p> <p>RJ2 B T17 S19 <i>Carrie's argument is better because she said she has felt an</i></p>

	(X's argument is better because he/she asked a scientist)	<i>earthquake. Eric only talked about earthquakes energy not how hard.</i>
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Volcanoes 1: Jose and Cara

Score	Description	Sample Student Response
3 Compare	Student makes a correct choice and critiques the justifications by comparing the forms of justifications used in both arguments (e.g. one uses empirical measurements and observations, but the other only uses less important (authority, plausible explanation).	<p>RJ2 C T17 S2 <i>I think Cara's argument was better supported. Cara used statistics to show how the volcanoes that have a large explosive power have ash clouds that reach higher into the sky. Jose used what he learned from his teacher on a field trip to Mt. St. Helen, but didn't show about any other volcano.</i></p> <p>RJ2 B T17 S7 <i>Cara better supported her argument by using factual evidence from scientific investigations that can be proved. Jose used something that a scientist said but no evidence to back it up</i></p> <p>RJ2 B T17 S16 <i>Cara's argument better supports the claim. She uses facts and statistics, which are more reliable than personal stories, or what an expert said, like Jose's argument.</i></p> <p>RJ2 A T17 S24 <i>Cara's argument is better because Jose used expert's information while Cara used scientific research</i></p>
2 Correct Choice and Identification	Student makes a correct choice and critiques the justification by identifying the correct form of justification used in one of the arguments.	<p>RJ2 A T13 S10 <i>Cara's because hers tells how high it goes and Jose's, his just tells the year</i></p> <p>RJ2 A T13 S11 <i>Cara better supports her argument because she uses evidence from two volcanoes to compare and contrast instead of Jose who only used one.</i></p> <p>RJ2 B T17 S23 <i>Jose's argument was the larger the explosion power the ash clouds reach higher in the sky. A scientist gave detail on to what happen. Cara's argument has a comparison of two volcano eruptions, one that was power and one that wasn't. Cara's argument better supports the argument.</i></p>
1 Correct Choice	Student makes a correct choice, but uses less important justifications to identify a stronger argument.	<p>RJ2 A T17 S1 <i>Cara's argument because there are facts and two different examples.</i></p> <p>RJ2 B T17 S19 <i>Cara's argument is better because she states that after the volcano there are ash clouds it becomes dark and that she says that explosive power are very high in the sky.</i></p> <p>RJ2 C T17 S26 <i>Cara because she gave details, examples and supported all of her examples</i></p>
0 No Choice or Incorrect Choice	<p>0.1 No choice</p> <p>0.2 Wrong choice plus no reason (X's argument is better)</p> <p>0.3 Wrong choice plus wrong reason (X's argument is better because he/she gave a lot of evidence)</p> <p>0.4 Wrong choice plus right reason (X's argument is better because he/she asked a scientist)</p>	<p>RJ2 B T17 S21 <i>Jose's because he described what happened when the volcano erupted and Cara's just explain.</i></p> <p>RJ2 B T17 S22 <i>Jose better supports the argument because it has more detail and evidence.</i></p> <p>RJ2 A T13 S8 <i>I think Jose's argument was stronger because he tells how powerful the eruption was and what the effect was.</i></p>

Volcanoes 2: Allen and Deshawn

Score	Description	Sample Student Response
3 Compare	Student makes a correct choice and critiques the justifications by comparing the forms of justifications used in both arguments (e.g. one uses empirical measurements and observations, but the other only uses less important (authority, plausible explanation)).	RJ2 A T17 S23 I think Allen best supports his argument because he has examples that come from science investigations and Deshawn only has personal opinions and claims RJ2 D T17 S22 <i>Allen better supports his argument because he is using real data that can be measured and recorded.</i> <i>Deshawn is using personal experience from a gift shop.</i> RJ2 D T17 S17 <i>Allen supports his argument with scientific data from investigations. Deshawn supported his argument with a personal story about the claim, which is not as reliable as scientific data form investigations.</i>
2 Correct Choice and Identification	Student makes a correct choice and critiques the justification by identifying the correct form of justification used in one of the arguments.	RJ2 B T17 S21 <i>Allen's because he used temperatures and details to support his claim of magma more than Deshawn did to support his.</i> RJ2 B T17 S23 <i>Allen's argument because he used facts he learned and gives specific temperature's of how hot the as and whether its thin or thick.</i> RJ2 B T17 S22 <i>Allen better supports the argument because he has evidence about how and what happens.</i> RJ2 B T17 S27 <i>Allen had more detail and evidence.</i>
1 Correct Choice	Student makes a correct choice, but uses less important justifications to identify a stronger argument.	RJ2 B T17 S25 <i>Allen had a better argument because he gave more of an explanation, also used facts to support his claim whereas Deshawn didn't because he just guessed why he was right.</i> RJ2 D T17 S22 <i>Allen's does because it has more facts</i> RJ2 C T17 S28 <i>Allen's because he is more specific about what he's talking about</i>
0 No Choice or Incorrect Choice	0.1 No choice 0.2 Wrong choice plus no reason (X's argument is better) 0.3 Wrong choice plus wrong reason (X's argument is better because he/she gave a lot of evidence) 0.4 Wrong choice plus right reason (X's argument is better because he/she asked a scientist)	RJ2 A T13S10 <i>Deshawn because is sounds like a better argument</i> RJ2 A T13 S8 <i>I think Deshawn's argument because he told why he thinks this. In Allen's argument, he kept repeating himself and saying that it's very thin whereas Deshawn gives an example and backs it up with facts he knows.</i> RJ2 A T13 S7 <i>Deshawn does because he implies more information than Allen does.</i>