

Relevant-supporting Evidence General Rubric

Level	Description	Observation
3 RSE for Science and Claim	Student limits all of the empirical evidence to that which is relevant to the science in the claim and supports the relationship in the claim.	<ul style="list-style-type: none"> • Student’s claim and evidence only reference the relevant science variable (Note: Can be either relevant science variable or both relevant science variables)
2 RSE for Claim	<p>Student uses empirical evidence that supports and is relevant to the relationship in the claim</p> <p>(Note: This can include irrelevant science if it still supports the claim).</p>	<ul style="list-style-type: none"> • Student’s claim and evidence only reference the irrelevant science variable data OR • Student’s claim and evidence reference both the irrelevant science variable data and the relevant science variable data:
1 Some RSE	<p>Student provides a mixture of relevant-supporting empirical evidence as well as irrelevant and/or non-supporting data to support the relationship in the claim.</p> <p style="text-align: center;">OR</p> <p>Student only provides some of the necessary relevant-supporting empirical evidence to support the relationship for part of the claim.</p>	<ul style="list-style-type: none"> • Evidence is larger than the claim <ul style="list-style-type: none"> ○ Student’s claim references either relevant science variable OR the irrelevant science variable, but they use data for only some of the variables they make the claim about. • Claim is larger than their evidence <ul style="list-style-type: none"> ○ Student’s claim references either or both relevant science variables OR the irrelevant science variable, but they present more data than is in the claim.
0 No RSE	Student provides only irrelevant or non-supporting data (does not provide any relevant-supporting empirical evidence) for his/her claim.	<ul style="list-style-type: none"> • No empirical evidence (i.e., only provide a claim). OR • Only irrelevant empirical evidence

Relevant-supporting Evidence Specific Rubrics

EARTHQUAKE 1A/B: JOE

Level	Description	Observation	Example
3 RSE for Science and Claim	Student limits all of the empirical evidence to that which is relevant to the science in the claim and supports the relationship in the claim.	<p>Student’s claim and evidence only reference the relevant science variable (Rock type and/ or depth with strength) (Note: Can be either relevant science variable or both relevant science variables)</p> <ul style="list-style-type: none"> • Rock type (relevant science variable): <ul style="list-style-type: none"> ○ Softer ground materials are related to earthquakes with more destructive strength ○ Harder ground materials are related to earthquakes with less destructive strength <p style="text-align: center;">OR</p> • Depth (relevant science variable): <ul style="list-style-type: none"> ○ Earthquakes that happen closer to the Earth’s surface tend to be more destructive strength ○ Earthquakes that happen further from the Earth’s surface tend to be less destructive strength <p style="text-align: center;">OR</p> • Rock type and Depth (relevant science variables) <ul style="list-style-type: none"> ○ Earthquakes that happen closer to the Earth’s surface and in softer ground materials tend to be more destructive strength ○ Earthquakes that happen further from the Earth’s surface and in harder ground materials tend to be less destructive strength 	<p>S516: 12/12: “Earthquakes can be stronger or weaker than others because of the ground material and how far they are from the crust [CLAIM]. <u>Earthquakes A and B had hit soft ground and were closer to the surface becoming the strongest earthquakes [EVIDENCE].</u> Since earthquakes travel in waves and are strongest where the epicenter is they won’t weaken much if they are close to the surface. Also since the ground is soft earthquakes won’t lose much power pushing through the ground.” <i>[Provides a claim. Provides evidence for both relationships between depth and rock type with strength. No irrelevant evidence is provided.]</i></p> <p>d3t3vis05: The strength of the earthquake relates to how close the earthquake is to the surface of the earth and the rock type [CLAIM]. <u>This is because the strongest earthquake was the closest to the earth’s surface but had the softest rock. The weakest earthquake was the opposite [EVIDENCE].</u> One claim that is wrong is that the air temperature relates to the strength. This is wrong because the air temperatures are mixed. For example, the coldest air temperature was during the middle intensity. <i>[Provides a claim. Provides evidence for both relationships between depth and rock type with strength. No irrelevant evidence is provided.]</i></p> <p>D2 T2 V5 S13: "the distance the earthquake is to the surface of the Earth [CLAIM]. This is true because in the graph, <u>the earthquakes that started closest to the surface of the Earth, the more strength the earthquake had [EVIDENCE].</u> The claim that an earthquake's strength varies because of the temperature is false because an earthquake happens in ground, not air, which is the measured temperature." <i>[Provides a claim. Provides evidence for one relationship—depth with strength. No irrelevant evidence is provided.]</i></p>

2
RSE for
Claim

Student uses empirical evidence that supports and is relevant to the relationship in the claim

(Note: This can include irrelevant science if it still supports the claim).

Student's claim and evidence only reference the irrelevant science variable data (air temperature)

- Higher air temperatures are related to more destructive earthquakes
- Lower air temperatures are related to less destructive earthquakes

OR

Student's claim and evidence reference both the irrelevant science variable data (air temperature) and the relevant science variable data (rock type and/or depth with strength):

- Average air temperature (irrelevant science variable):
 - Higher air temperatures are related to more destructive earthquakes
 - Lower air temperatures are related to less destructive earthquakes

AND

- Rock type (relevant science variable):
 - Softer ground materials are related to earthquakes with more destructive strength
 - Harder ground materials are related to earthquakes with less destructive strength

OR

- Depth (relevant science variable):
 - Earthquakes that happen closer to the Earth's surface tend to be more destructive strength
 - Earthquakes that happen further from the Earth's surface tend to be less destructive strength

OR

- Rock type and Depth (relevant science variables)
 - Earthquakes that happen closer to the Earth's surface and in softer ground materials tend to be more destructive strength
 - Earthquakes that happen further from the

d6t6v1so7: "the type of rocksthat they travel through and the average air temperature when they occur [CLAIM]. It is true because the strongest earthquake happend on soft ground and in cold temperatures [EVIDENCE]. The other claims are wrong because it doesn't matter wether they happen on an island or not." *[Provides a claim about rock type and air temperature, and then provides evidence for each.]*

d6t6v1s24: "The strength of earthquakes are related to how close they are to the Earths surface, what type of rock they travel through, and the average air temperature when they occurred [CLAIM]. This is true because when I looked at the chart I noticed that whenever the strength was high the depth was very close to the surface, the rock type was soft, and the temperature was low [EVIDENCE]. Another claim that is wrong like, weather they happen on islands, is wrong because earthquakes can happen anywhere at anytime." *[Provides a claim about depth, rock type and air temperature, and then provides evidence for each.]*

Earth's surface and in harder ground materials tend to be less destructive strength

1
Some
RSE

Student provides a mixture of relevant-supporting empirical evidence as well as irrelevant and/or non-supporting data to support the relationship in the claim.

OR

Student only provides some of the necessary relevant-supporting empirical evidence to support the relationship for part of the claim.

Evidence is larger than the claim

- Student's claim references either relevant science variable (rock type, depth) OR the irrelevant science variable (air temperature), but they use data for only some of the variables they make the claim about.

OR

Claim is larger than their evidence

- Student's claim references either or both relevant science variables (rock type, depth) OR the irrelevant science variable (air temperature), but they present more data than is in the claim.

S7: 12/12: "My claim is that earthquake A was the most destructive earthquake because of the depth [CLAIM]. My evidence is the map and the table. The table shows that earthquake A was an island and the depth was shallow 26-30 in. deep and the ground was soft so it could do a lot of destruction [EVIDENCE]. My reasoning is that A is the strongest earthquake compared to earthquake E."
[Provides a claim. Provides evidence, but the evidence is both relevant and irrelevant. Island and soft are irrelevant to this student's claim (as would be air temperature). Depth is relevant.]

D2 T2 V1 S10: "Whether they happen on islands, how close they are to the Earths surface and the type of rock they travel through [CLAIM]. it is true because if on an island may effect it more than it is on a continent. the softer the rock the easier it is to break or go through. Also the closer it is the surface the harder it is like in earthquake (A) it was a lot shallower than the others so it was more sever at a level 12 [EVIDENCE]. because air temperature does not effect the severity of a earthquake."
[Claim is larger than their evidence. Claim is about island location, depth and rock type, but evidence is only about rock type and depth.]

<p>0 No RSE</p>	<p>Student provides only irrelevant or non-supporting data (does not provide any relevant-supporting empirical evidence) for his/her claim.</p>	<p>No empirical evidence (e.g. only provide a claim). OR Only irrelevant empirical evidence (e.g. air temperature)</p>	<p>S53: 12/12: “What makes earth-quakes stronger is that the more shallow it is the earth-quake will be stronger but the more deep it is it will be less destructive [CLAIM]”. <i>[Only provides a claim, therefore no evidence to measure]</i></p> <p>Example: The strength of an earthquake depends on its depth [CLAIM]. As the air temperature increases the earthquakes become more destructive [CLAIM]. <i>[Provides 2 claims with no evidence for either.]D3T3V2S17:</i></p> <p>“How close they occur to the surface, and how soft the rock is [CLAIM]. Because the evidence shows it. Because they are not supported by the data. <i>[Provides a claim and says there is evidence, but doesn't state it.]</i></p>
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EARTHQUAKE 2A/B: NAN

Level	Description	Observation	Example
3 RSE for Science and Claim	Student limits all of the empirical evidence to that which is relevant to the science in the claim and supports the relationship in the claim.	<p>Student’s claim and evidence only reference the relevant science variable (energy released and/ or time with strength) (Note: Can be either relevant science variable or both relevant science variables)</p> <ul style="list-style-type: none"> • Energy released (relevant science variable): <ul style="list-style-type: none"> ○ Larger amounts of energy released are related to earthquakes with more destructive strength ○ Smaller amounts of energy released are related to earthquakes with less destructive strength <p style="text-align: center;">OR</p> • Time (relevant science variable): <ul style="list-style-type: none"> ○ Earthquakes that shake longer tend to be more destructive strength ○ Earthquakes that shake for shorter amounts of time tend to be less destructive strength <p style="text-align: center;">OR</p> • Energy released and Time (relevant science variables) <ul style="list-style-type: none"> ○ Earthquakes that release more energy and shake for longer amounts of time tend to be more destructive strength ○ Earthquakes that release less energy and shake for shorter amounts of time tend to be less destructive strength 	<p>60010348: “how much energy they release and how much time it takes [CLAIM]. <u>according to the graph, the longest earthquake took the longest time. also, the energy was high, so the strength was high also</u> [EVIDENCE]. the other claims would mean that even though the fault is the same , nothing changes.” <i>[Provides a claim. Provides evidence for both relationships between time and energy with strength. No irrelevant evidence is provided.]</i></p> <p>d3 t3 v3 s03: “how long they last [CLAIM] <u>because the strongest lasted for the longest</u> [EVIDENCE], and how much energy they release [CLAIM] <u>because the strongest released the most energy</u> [EVIDENCE]. it is supported by the chart. None.” <i>[Provides 2 separate claims. Provides evidence for both relationships between time and energy with strength. No irrelevant evidence is provided.]</i></p> <p>D6 T6 V1 S06: “how long they last [CLAIM]. <u>this is true because if it has high strength it lasts longer so more damage can happen</u> [EVIDENCE]. claim 1 is wrong because it doesn't matter if it happens in cities.” <i>[Provides a claim. Provides evidence for one relationship—time with strength. No irrelevant evidence is provided.]</i></p>
2 RSE for Claim	Student uses empirical evidence that supports and is relevant to the relationship in the claim (Note: This can include irrelevant	<p>Student’s claim and evidence only reference the irrelevant science variable data (fault type)</p> <ul style="list-style-type: none"> • Reverse (or normal) faults are related to more destructive earthquakes • Reverse (or normal) faults are related to less destructive earthquakes <p style="text-align: center;">OR</p> <p>Student’s claim and evidence reference both the irrelevant science variable data (fault type) and the</p>	<p>D3 T3 V3 S10: “How long they last, how much energy is released, and the type of fault where they begin [CLAIM]. <u>On the chart, it says that the strongest type of earthquake released a large amount or energy, lasted for thirty seconds, and had a reverse type of fault. All which affected the strength of the earthquake</u> [EVIDENCE]. The place of an earthquake wouldn't effect how strong the earthquake is.” <i>[Provides a claim about time, energy and fault type, and then provides evidence for each.]</i></p>

science if it still supports the claim).	relevant science variable data (energy released and/or time with strength):	<ul style="list-style-type: none"> • Fault type (irrelevant science variable): <ul style="list-style-type: none"> ○ Reverse (or normal) faults are related to more destructive earthquakes ○ Reverse (or normal) faults are related to less destructive earthquakes <p style="text-align: center;">AND</p> • Energy released (relevant science variable): <ul style="list-style-type: none"> ○ Larger amounts of energy released are related to earthquakes with more destructive strength ○ Smaller amounts of energy released are related to earthquakes with less destructive strength <p style="text-align: center;">OR</p> • Time (relevant science variable): <ul style="list-style-type: none"> ○ Earthquakes that shake longer tend to be more destructive strength ○ Earthquakes that shake for shorter amounts of time tend to be less destructive strength <p style="text-align: center;">OR</p> • Energy released and Time (relevant science variables) <ul style="list-style-type: none"> ○ Earthquakes that release more energy and shake for longer amounts of time tend to be more destructive strength ○ Earthquakes that release less energy and shake for shorter amounts of time tend to be less destructive strength 	
1 Some RSE	Student provides a mixture of relevant-supporting empirical evidence as well as irrelevant and/or non-supporting data to support the relationship in the claim.	<p>Evidence is larger than the claim</p> <ul style="list-style-type: none"> • Student’s claim references either relevant science variable (energy, time) OR the irrelevant science variable (fault type), but they use data for only some of the variables they make the claim about. <p style="text-align: center;">OR</p> <p>Claim is larger than their evidence</p> <ul style="list-style-type: none"> • Student’s claim references either or both relevant science variables (energy, time) OR the irrelevant 	<p><i>EXAMPLE: “How long they last impacts the strength [CLAIM]. <u>Earthquakes that last longer and release more energy are stronger</u> [EVIDENCE]. [Provides a claim. Provides evidence, but there is evidence for more variables than in the claim.</i></p> <p>D6 T6 V! S08: “How long they last and how much energy they release [CLAIM]. That true because how long they last and how much energy they give is important because <u>if they are</u></p>

<p>OR Student only provides some of the necessary relevant-supporting empirical evidence to support the relationship for part of the claim.</p>	<p>science variable (fault type), but they present more data than is in the claim.</p>	<p><u>really strong and last forever that can cause a lot of damage</u> [EVIDENCE]. The what cities are wrong because it does not matter where it happen.” <i>[Claim is larger than their evidence. Claim is about time and energy, but evidence is only about energy.]</i></p>	
<p>0 No RSE</p>	<p>Student provides only irrelevant or non-supporting data (does not provide any relevant-supporting empirical evidence) for his/her claim.</p>	<p>No empirical evidence (e.g. only provide a claim). OR Only irrelevant empirical evidence (e.g. fault type)</p>	<p>d6 t6 v1 s14: “The strength of earthquakes is related to how it will last and how powerful it is [CLAIM]. This is true because scientist have looked at this many times and have had test on like small volcanos like modles . One thing that i do not get is how do they no that there is 4 things in they earth cant even go in between them because there no metal that cant melt in a veary hot condition.3” <i>[Only provides a claim, therefore no evidence to measure]</i></p> <p>d6t6v2s15: “how much energy they release [CLAIM]. its how many energy that it release [REPEATS CLAIM]. how long they lost? that does nothing to the question.” <i>[Repeats claim with no evidence for either.]</i></p> <p>D6T6V3S10: “the energy released and the time [CLAIM]. it is true because the chart says so. it wouldn't be if it happened in a city because that wouldn't change the outcome.” <i>[Provides a claim and says there is evidence, but doesn't state it.]</i></p>

VOLCANO 1A/B: AISHA

Level	Description	Observation	Example
3 RSE for Science and Claim	Student limits all of the empirical evidence to that which is relevant to the science in the claim and supports the relationship in the claim.	<p>Student’s claim and evidence only reference the relevant science variable (thickness and/ or number of gas bubbles with power) (Note: Can be either relevant science variable or both relevant science variables)</p> <ul style="list-style-type: none"> Thickness of magma (relevant science variable): <ul style="list-style-type: none"> Thicker magma is related to more explosive volcanic eruptions. Runnier magma is related to less explosive volcanic eruptions <p>OR</p> <ul style="list-style-type: none"> Number of gas bubbles (relevant science variable): <ul style="list-style-type: none"> Magma with more gas bubbles tends to be related to more explosive volcanic eruptions. Magma with less gas bubbles tends to be related to less explosive volcanic eruptions. <p>OR</p> <ul style="list-style-type: none"> Thickness of magma and Number of gas bubbles (relevant science variables) <ul style="list-style-type: none"> Magma that is thicker and contains more gas bubbles tends to be related to more explosive volcanic eruptions. Magma that is runnier and contains less gas bubbles tends to be related to less explosive volcanic eruptions. 	<p>d3t3v1s04: “the thickness of the magma and the number of gas bubbles in it [CLAIM]. The magma was sticky and had lots of gas bubbles when the force of the explosion was stronger but not as much when the explosion was weaker [EVIDENCE]. Because this is the only true claim.” <i>[Provides a claim. Provides evidence for both relationships between thickness and number of gas bubbles in magma with volcanic explosivity. No irrelevant evidence is provided.]</i></p> <p>D3T3V1S07: “thickness of the magma, and the number of gas bubbles in the magma [CLAIM]. It is true because, as the power level goes down the thickness goes down. Also as the power goes down the number of gas bubbles do too [EVIDENCE]. The surface temperture doesn't matter because it goes everywhere, from low to high, no matter what the power, the number of bubbles, or the thickness is.” <i>[Provides a claim. Provides evidence for both relationships between thickness and number of gas bubbles in magma with volcanic explosivity. No irrelevant evidence is provided.]</i></p> <p>D2 T2 V4 S09: “the number of gas bubbles in the magma [CLAIM] because when there are more gas bubbles such as in Volcano A, B, and C, the eruption is bigger [EVIDENCE]. Because the evidence said so. yes, but I don't know which one.” <i>[Provides a claim. Provides evidence for one relationship—gas bubbles with explosivity. No irrelevant evidence is provided.]</i></p>
2 RSE for Claim	Student uses empirical evidence that supports and is relevant to the relationship in the claim (Note: This can	<p>Student’s claim and evidence only reference the irrelevant science variable data (surface temperature)</p> <ul style="list-style-type: none"> Higher (or lower) average surface temperatures are related to more explosive eruptions. Higher (or lower) average surface temperatures are related to less explosive eruptions. <p>OR</p> <p>Student’s claim and evidence reference both the</p>	<p>D2 T2 V1 S27: “The average surface temperature at the sight of the eruption [CLAIM]. It is true because the one with the most power had the lowest temperature [EVIDENCE]. A different claim is wrong because it describes one of the lower powered eruptions.” <i>[Claim and evidence are about the irrelevant variable only.]</i></p> <p>D2 T2 V4 S17: “the thickness of the magma, the number of</p>

include irrelevant science if it still supports the claim).	<p>irrelevant science variable data (fault type) and the relevant science variable data (thickness of magma and/or number of gas bubbles with power):</p> <ul style="list-style-type: none"> • Surface temperature (irrelevant science variable): <ul style="list-style-type: none"> ○ Higher (or lower) average surface temperatures are related to more explosive eruptions. ○ Higher (or lower) average surface temperatures are related to less explosive eruptions. <p style="text-align: center;">AND</p> • Thickness of magma (relevant science variable): <ul style="list-style-type: none"> ○ Thicker magma is related to more explosive volcanic eruptions. ○ Runnier magma is related to less explosive volcanic eruptions <p style="text-align: center;">OR</p> • Number of gas bubbles (relevant science variable): <ul style="list-style-type: none"> ○ Magma with more gas bubbles tends to be related to more explosive volcanic eruptions. ○ Magma with less gas bubbles tends to be related to less explosive volcanic eruptions. <p style="text-align: center;">OR</p> • Thickness of magma and Number of gas bubbles (relevant science variables) <ul style="list-style-type: none"> ○ Magma that is thicker and contains more gas bubbles tends to be related to more explosive volcanic eruptions. ○ Magma that is runnier and contains less gas bubbles tends to be related to less explosive volcanic eruptions. 	<p>gas bubbles in the magma, and the average surface temperature at the site of eruption [CLAIM]. <u>This is true because the data shows evidence of all these thing affecting the power of the eruption. for example when the thickness of the lava is sticky, the number of gas bubbles is sticky, and the average surface temperature is 6 degrees C, the power of the eruption is 6 (on a scale of 0-8), but when the thickness of the magma is runny, the number of gas bubbles is few, and the average surface temperature is 12 degrees C the power of the eruption is 1 [EVIDENCE].</u> Another claim is wrong because they would not show a difference of power in the eruption of the volcano.” <i>[Provides a claim about number of gas bubbles, thickness and surface temperature, and then provides evidence for each. AKA “data dump”.]</i></p>	
1 Some RSE	Student provides a mixture of relevant-supporting empirical evidence as well as irrelevant and/or non-supporting data to support the	<p>Evidence is larger than the claim</p> <ul style="list-style-type: none"> • Student’s claim references either relevant science variable (thickness, number of gas bubbles) OR the irrelevant science variable (surface temperature), but they use data for only some of the variables they make the claim about. <p>Claim is larger than their evidence</p>	<p><i>EXAMPLE: “gas bubbles in magma [CLAIM]. Magma that is stickier and has more gas bubbles will have larger explosions [EVIDENCE].</i> <i>[Provides a claim. Provides evidence, but there is evidence for more variables than in the claim.</i></p> <p>D6 T6 V2 S08: “Size of the volcano, and the number of gas</p>

<p>relationship in the claim.</p> <p>OR</p> <p>Student only provides some of the necessary relevant-supporting empirical evidence to support the relationship for part of the claim.</p>	<ul style="list-style-type: none"> Student’s claim references either or both relevant science variables (thickness, number of gas bubbles) OR the irrelevant science variable (surface temperature), but they present more data than is in the claim. 	<p>bubbles in the magma [CLAIM]. <u>It is true because, you need to know how many gas bubbles are in the magma to determine the size of the volcano</u> [EVIDENCE]. You don't really need to know the thickness of the magma because it only really matters how many gas bubbles there are.”</p> <p><i>[Claim is larger than their evidence. Claim is about number of gas bubbles in magma and size of the volcano, but evidence is only about gas bubbles.]</i></p> <p>8677: “The amount of gas bubbles in the magma and the thickness of the magma [CLAIM]. <u>This is true because the more gas bubbles there are the more pressure will build up inside the volcano</u> [EVIDENCE]. “average surface temperature at the site of eruption" this claim would be wrong. the temperature doesn't have anything to do with the power of the volcano.”</p> <p><i>[Claim is larger than their evidence. Claim is about number of gas bubbles and thickness of magma, but evidence is only about gas bubbles.]</i></p>	
<p>0 No RSE</p>	<p>Student provides only irrelevant or non-supporting data (does not provide any relevant-supporting empirical evidence) for his/her claim.</p>	<p>No empirical evidence (e.g. only provide a claim). OR Only irrelevant empirical evidence (e.g. surface temperature)</p>	<p>D2 T2 V4 S35: “The thickness of the magma, and the amount of bubbles in the magma [CLAIM]. Because Thinner magma is lighter, and can be packed together more. Also, the amount of bubbles suggest how much air is in the magma. The temperature clearly does not matter. After repeated trials, the varied temperatures changed nothing”</p> <p><i>[Provides a claim, but there is no empirical evidence.]</i></p>

VOLCANO 2A/B: VERONICA

Level	Description	Observation	Example
3 RSE for Science and Claim	Student limits all of the empirical evidence to that which is relevant to the science in the claim and supports the relationship in the claim.	<p>Student’s claim and evidence only reference the relevant science variable (thickness and/or temperature with power) (Note: Can be either relevant science variable or both relevant science variables)</p> <ul style="list-style-type: none"> • Thickness of magma (relevant science variable): <ul style="list-style-type: none"> ○ Thicker magma is related to more explosive volcanic eruptions. ○ Runnier magma is related to less explosive volcanic eruptions <p style="text-align: center;">OR</p> • Temperature of magma (relevant science variable): <ul style="list-style-type: none"> ○ Cooler magma tends to be related to more explosive volcanic eruptions. ○ Hotter magma tends to be related to less explosive volcanic eruptions. <p style="text-align: center;">OR</p> • Thickness of magma and Number of gas bubbles (relevant science variables) <ul style="list-style-type: none"> ○ Magma that is thicker and cooler tends to be related to more explosive volcanic eruptions. ○ Magma that is runnier and hotter tends to be related to less explosive volcanic eruptions. 	<p>D4T4V3S15: “the thickness and the tempature of the magma/lava [CLAIM]. <u>if the magma was very sticky and cool, then the volcano will expolode more violently. if the magma is hot and runny it would build up less pressure</u> [EVIDENCE]. the amount of rain fall and/or if it was on a island would have nothing to do with the eruption of a volcano because it depends on the magma and pressure that is built up.” <i>[Provides a claim. Provides evidence for both relationships between thickness and temperature of magma with volcanic explosivity. No irrelevant evidence is provided.]</i></p> <p>D4T4V3SO2: “the tempature and thickness of the magma [CLAIM]. <u>Because when i look at the chart, i can tell that the volcanoes with sticky magma have a higher raiting on the VEI scale, and the volcanoes with the cooler magma means the magma is sticker</u> [EVIDENCE]. because of the chart, I can tell that it doesn't matter how much rain there is where the volcano is because the volcano with the highest raiting on the VEI scale had 63 inches of ran while the 2nd lowest had 52 inches of rain, and the volcanos inbetween them had 33 and 47 inches, so the number of inches is completely diffrent even if it's number on the scale is very close to it.” <i>[Provides a claim. Provides evidence for both relationships between thickness and temperature of magma with volcanic explosivity. No irrelevant evidence is provided.]</i></p> <p>D10T10V2S14: “the power of the volcano is related to the thickness of the magma [CLAIM] because <u>if its thick it will have more power to it</u> [EVIDENCE]. it will have more power to it. it desnt matter if it happens on islands it will be the same.” <i>[Provides a claim. Provides evidence for one relationship— thicness with explosivity. No irrelevant evidence is provided.]</i></p>
2 RSE for Claim	Student uses empirical evidence that supports and is relevant to the	<p>Student’s claim and evidence only reference the irrelevant science variable data (amount of rain)</p> <ul style="list-style-type: none"> • Higher (or lower) average yearly amount of rain is related to more explosive eruptions. 	<p>D3 T3 V3 S02: “The temperature of the magma [CLAIM]. <u>In the chart, the eruptions from the volcanoes with the highest power had the lowest temperature of the magma</u> [EVIDENCE]. The power is not related to if they happen on islands or not</p>

relationship in the claim	(Note: This can include irrelevant science if it still supports the claim).	<ul style="list-style-type: none"> • Higher (or lower) average yearly amount of rain is related to less explosive eruptions. OR Student’s claim and evidence reference both the irrelevant science variable data (fault type) and the relevant science variable data (thickness of magma and/or number of gas bubbles with power): • Average yearly amount of rain (irrelevant science variable): <ul style="list-style-type: none"> ○ Higher (or lower) average yearly amount of rain is related to more explosive eruptions. ○ Higher (or lower) average yearly amount of rain is related to less explosive eruptions. AND • Thickness of magma (relevant science variable): <ul style="list-style-type: none"> ○ Thicker magma is related to more explosive volcanic eruptions. ○ Runnier magma is related to less explosive volcanic eruptions OR • Temperature of magma (relevant science variable): <ul style="list-style-type: none"> ○ Cooler magma tends to be related to more explosive volcanic eruptions. ○ Hotter magma tends to be related to less explosive volcanic eruptions. OR • Thickness of magma and Number of gas bubbles (relevant science variables) <ul style="list-style-type: none"> ○ Magma that is thicker and cooler tends to be related to more explosive volcanic eruptions. ○ Magma that is runnier and hotter tends to be related to less explosive volcanic eruptions. 	<p>because the chart does not even include whether the eruptions happened on islands or not.” [Claim and evidence are about the irrelevant variable only.]</p>
			<p>D3T3V1S07: “the temperture of the magma, and the amount of rain where the volcano is located [CLAIM]. <u>It is true, because the one with the highest eruption level is the one with the least temperture, and the most rainfall [EVIDENCE].</u> The thinkness doesn't matter because, one of the lower eruption levels had thicker magma just like the ones with higher eruption.” [Provides claim and evidence on a relevant (temperature) and irrelevant (amount of rain) variable.</p>
			<p>D3 T3 V2 S10: “This is true because the volcano erupts really strongly depending on the thickness of the magma [CLAIM]. <u>The magma should be sticky in order for the volcano to have a great power while erupting [EVIDENCE].</u> The temperature matters [CLAIM] <u>because a volcano erupts more powerfully when it has a low temperature [EVIDENCE].</u> Also, the amount of rainfall matters [CLAIM] <u>because if there is a lot of rain, then the volcano will erupt more powerfully [EVIDENCE].</u> It doesn't really matter whether they happened on islands or not, although it might a little. It might matter where the volcano is and the elevation and shape of the land it is on, but mostly, it should be the same in a lot of places. I might be wrong on this though because I don't know the different shapes of land all over the world.” [Provides a claim and evidence for number of gas bubbles, thickness and surface temperature. AKA “data dump”.]</p>
1 Some RSE	Student provides a mixture of relevant-supporting empirical evidence as well as	<p>Evidence is larger than the claim</p> <ul style="list-style-type: none"> • Student’s claim references either relevant science variable (thickness, temperature) OR the irrelevant science variable (amount of rain), but they use data 	<p>EXAMPLE: “<u>thickness of magma [CLAIM]. Magma that that is stickier and cooler will have larger explosions [EVIDENCE].</u> [Provides a claim. Provides evidence, but there is evidence for</p>

<p>irrelevant and/or non-supporting data to support the relationship in the claim.</p> <p>OR</p> <p>Student only provides some of the necessary relevant-supporting empirical evidence to support the relationship for part of the claim.</p>	<p>for only some of the variables they make the claim about.</p> <p>OR</p> <p>Claim is larger than their evidence</p> <ul style="list-style-type: none"> • Student’s claim references either or both relevant science variables (thickness, temperature) OR the irrelevant science variable (amount of rain), but they present more data than is in the claim. 	<p><i>more variables than in the claim.</i></p> <p>D3 T3 V3 S11: “The thickness of the magma, the temperature of the magma, and the amount of rain where the volcano where it's located [CLAIM]. <u>The warmer it is, the more power a volcano has. When a volcano has more power, the magma isn't as thick [EVIDENCE].</u> Whether or not the volcano is on an island doesn't have an effect on the power because it wasn't exactly in the chart.”</p> <p><i>[Claim is larger than their evidence. Claim is about thickness, temperature, and amount of rain, but evidence is only about temperature and thickness.]</i></p> <p>D3 T3 V3 S16: “the temperature and thickness of the magma. This is true because with the extra thickness it is harder to push out so more pressure builds up. Another claim is wrong because the rain doesn't affect this.”</p> <p><i>[Claim is larger than their evidence. Claim is about temperature and thickness of magma, but evidence is only about thickness.]</i></p>
<p>0 No RSE</p>	<p>Student provides only irrelevant or non-supporting data (does not provide any relevant-supporting empirical evidence) for his/her claim.</p>	<p>No empirical evidence (e.g. only provide a claim).</p> <p>OR</p> <p>Only irrelevant empirical evidence (e.g. amount of rain).</p> <p>d4 t4 v1 s10: “the thickness of the lava and the temperature of the magma [CLAIM]. because they list them in the data collected. because if it rains near a volcano the magma will cool.”</p> <p><i>[Provides a claim, but there is no empirical evidence.]</i></p> <p>D3T3V2S17: “thickness of the magma [CLAIM]. Because the data shows it. Because the data shows that that the others are unrelated.”</p> <p><i>[Provides a claim, but there is no empirical evidence.]</i></p>