Annotation Form

Anchor Set
KAS Kentucky Science Gr 7
SC071616_08
Balloon Rocket

Paper	UIN/FT Number	Score	Notes
Anchor01	**(AABBIP13821001098301)**	**0**	**Anchor Paper 1** **Score Point 0** There is no evidence that the student has an understanding of the question. The explanation in Part A is too vague to establish what variable(s) will be kept constant and what variable(s) will be changed for an investigation. The description in Part B is vague with respect to how variables will be measured. The description in Part C is irrelevant. Holistically, the response demonstrates no understanding.
Anchor02	**(AABBIP13821000022955)**	**0**	**Anchor Paper 2** **Score Point 0** There is no evidence that the student has an understanding of the question. The explanation in Part A does not establish a variable to be changed, only a selection of three materials to be used. The description in Part B contains no information about how the variables will be measured. The description in Part C mentions forces acting on the rocket, but nothing is included to show any understanding of how these materials will have any affect. Holistically, the response demonstrates no understanding.

Paper	UIN/FT Number	Score	Notes
Anchor03	**(AABBIP13821000014868)**	**0**	**Anchor Paper 3** **Score Point 0** There is no evidence that the student has an understanding of the question. The explanation in Part A does not establish a variable to be changed, only a selection of three materials to be used. The description in Part B is not clear as to how variables will be measured. The description in Part C introduces helium, which is incorrect, along with irrelevant information regarding the straws and the fishing line. None of this information indicates how the forces acting on the rocket will be affected by these materials. Holistically, the response demonstrates no understanding.
Anchor04	**(AABBIP13821000014858)**	**1**	**Anchor 4** **Score Point 1** There is evidence that the student has a minimal understanding of the question. The explanation in Part A is not clear about what materials will change and be kept constant, only indicating that three items will not be used. The description in Part B does not focus on measurements but rather on how the rocket will be assembled. The description in Part C contains one piece of information that indicates very minimal understanding of how one of the choices of material will affect the forces acting on the rocket (*the fishing line is less mass so that means that it would go faster and more smoothly*). The remainder of the information in Part C is incorrect or irrelevant. Holistically, the response reflects minimal understanding of the complex ideas associated with the question.

Paper	UIN/FT Number	Score	Notes
Anchor05	**(AABBIP13821000014796)**	**1**	**Anchor Paper 5** **Score Point 1** There is evidence that the student has a minimal understanding of the question. The explanation in Part A is not correct with respect to a variable to change as it indicates a misunderstanding of what it means to have a variable that will change during the investigation. Instead, two materials that will be used are identified. A description is not provided for Part B. The description in Part C indicates minimal understanding of the diameter of the balloon having an effect on the forces acting on the rocket (*The bigger the diameter of the balloons the more it travels*). Holistically, the response reflects minimal understanding.
Anchor06	**(AABBIP13821000012699)**	**1**	**Anchor Paper 6** **Score Point 1** There is evidence that the student has a minimal understanding of the question. The explanation in Part A indicates a lack of understanding of selecting a variable to be changed during the investigation. However, minimal understanding of how materials affect the forces acting on the rocket is demonstrated (*keep the 9-inch round balloons baecause it would make you go farther*). **Note** that credit is earned even though this information is presented in Part A since the student is clearly speaking to the forces acting on the rocket by the 9-inch balloon and this information is minimally correct. The description in Part B is not relevant to measuring the variables. The description in Part C is irrelevant. Holistically, the response reflects minimal synthesis and understanding.

Paper	UIN/FT Number	Score	Notes
Anchor07	**(AABBIP13821000257621)**	**2**	**Anchor Paper 7** **Score Point 2** There is evidence that the student has a limited understanding of the question. The explanation in Part A identifies a variable to change (*You change The balloon size*) and a variable to keep constant (*the amount of washers*). Although keeping the washers constant is not a strong selection, it is acceptable. The description in Part B shows some understanding of measuring the variables (*The inch size of a balloon, and the hight the ballon travels*). The description in Part C shows limited understanding of the weight of the balloon affecting the forces acting on the rocket (*The balloon has more whiet so it has to fight agenst gravity even harder*). Holistically, considering the strength of the response taken as a whole, this response reflects limited understanding of the complex ideas associated with conducting the investigation.
Anchor08	**(AABBIP13821000264447)**	**2**	**Anchor Paper 8** **Score Point 2** There is evidence that the student has a limited understanding of the question. The explanation in Part A identifies a variable to keep constant (*9-inch round ballons*), but the change variable is not clearly identified since the large-diameter straw is one of three straws available and it is not made clear if it is being replaced or if the straw sizes will be changing during the investigation. The description in Part B shows understanding of how to measure the variable (*by seeing how far the ballon travled in meters, and measure the ballons diameter in inches*), but is somewhat disconnected from the variables identified in Part A. The description in Part C contains some relevant information regarding materials affecting the forces acting on the rocket (*the larger the diameter the farther it will go [shown by the ballon rocket model], also the yarn and cotton string would create more friction*), but this too is somewhat disconnected from the variables selected in Part A. On balance, the response indicates some knowledge of the elements of the investigation, but understanding and synthesis are limited.

Paper	UIN/FT Number	Score	Notes
Anchor09	**(AABBIP13821000271632)**	**2**	**Anchor Paper 09** **Score Point 2** There is evidence that the student has a limited understanding of the question. The explanation in Part A identifies a valid variable to change (*the size of the ballons*), but which variable or variables to keep constant is vague. The description in Part B contains some relevant information for how the variable is measured (*how far they travel to see which one works the best*) which is not inconsistent with the size of the balloons. The description in Part C is consistent with the size of balloon and is valid (*If you change the size of the baloon, it will hold more air so it will travel farther*). Holistically, the response contains little in the way of elaboration but does indicate limited understanding and synthesis of the complex ideas associated with the investigation.
Anchor10	**(AABBIP13821000049983)**	**3**	**Anchor Paper 10** **Score Point 3** There is evidence that the student has a general understanding of the question. The explanation in Part A identifies two variables to be kept constant and a variable that will change during the investigation (*the fishing line and medium straw as a constant. The variables will be different size balloons*). The description in Part B is relevant. The description in Part C is consistent with the variables selected in Part A and does indicate general understanding of the forces acting on the rocket due to those variables (*Fishing line...is smoother allowing the less resistance. The medium straw has more weight than a small straw but not too much weight. The 7 inch balloon has less mass which allows it to travel farther*). Holistically, the response is generally coherent and reflects general understanding and synthesis of the complex ideas associated with the investigation.

Paper	UIN/FT Number	Score	Notes
Anchor11	**(AABBIP13821000012715)**	**3**	**Anchor Paper 11** **Score Point 3** There is evidence that the student has a general understanding of the question. The explanation in Part A identifies a variable to be kept constant (*keep the mass of the 5 washers the same*) and variables to change (*change the size of the balloons and the size of the straws*). Although keeping the number of washers constant is not a strong choice, it is acceptable. The description in Part B is relevant and clear for how the variables will be measured (*organize the data to show how far the rocket went for each change . . . would not change two things at once, only test one variable at a time*). The description in Part C indicates general understanding and synthesis of the forces acting on the balloon due to the variables being tested (*However fast the rocket takes off, the more force the rocket has on the string. The bigger the balloon, the faster it takes off and the farther it goes. The bigger the straw diameter, the faster and farther the rocket goes*). Holistically, the response is coherent, consistent, and indicates general understanding of all facets of the investigation.

Paper	UIN/FT Number	Score	Notes
Anchor12	**(AABBIP13821000267087)**	**3**	**Anchor Paper 12** **Score Point 3** There is evidence that the student has a general understanding of the question. The explanation in Part A contains information that identifies two variables to change (*the size of the balloon because the mass could affect how fast it goes. I will also use the straws as a variable becuase they are different [l]enghts and could effect the propulsion*). Note that some students believe the straws are to be used for propulsion and that is acceptable. The variable to be kept constant is also stated and explained (*would keep the amount of air in the balloon constant becuase if it was off it could have a wild effect on the lauching which is not what we are testing*). The description in Part B is consistent with the information and variables to be tested in Part A and is relevant with respect to measuring those variables (*will get a 7 inch ballon and try it on each type of straw and see if it hits three meters. Then I will use the 8 inch and do the same thing along with the 9 inch. I can measure how the effect the speed with this*). The description in Part C indicates general synthesis as it is consistent with the materials selected and with how the investigation is being conducted to determine how the materials affect the forces acting on the rocket (*different sizes of balloons I could affect the mass acting the rocket and see if it lauches it the rocket farther. With the straws I could test how short or how long the lauching area is and if that makes the rocket go higher and lower and if it give it friction and force*). Holistically, the response is a higher score point 3 reflecting general understanding of how to conduct the investigation.

Paper	UIN/FT Number	Score	Notes
Anchor13	**(AABBIP13821000269047)**	**4**	**Anchor Paper 13** **Score Point 4** There is evidence that the student has a complete and thorough understanding of the question. The explanation in Part A is clear and correct as to what materials will be kept constant and what will be changed, and reasoning behind these choices is made clear (*I would change the size of the balloons and I would keep the type of line the same and type of straw the same. Keeping these variables constant would mean that I could explore the resistance of the air and the amount of force I need to complete my task*). The description in Part B is clear for how the variables will be measured (*I will measure my variables by making a note of which balloon size traveled the farthest . . . constant variables do not change and I will inflate each balloon to the same size and start the tests at the same point to ensure that my results are accurate*). Note that the imprecision in language with respect to inflating the balloons to the same size is a minor flaw that is irrelevant to the accuracy of the answer since it is clear from all other information in the response that the student is testing the power of the balloons based on their size. The description in Part C clearly indicates how the materials affect the forces acting on the rocket (*The fishing line and medium-diameter straws made less friction with each test and made the balloons and washers travel faster. Each balloon added more force to each experiment which changed the conclusions to each test*). Holistically, although not perfect, the response demonstrates complete and thorough understanding of the complex ideas associated with conducting the investigation.

Paper	UIN/FT Number	Score	Notes
Anchor14	**(AABBIP13821000267058)**	**4**	**Anchor Paper 14** **Score Point 4** There is evidence that the student has a complete and thorough understanding of the question. The explanation in Part A is clear, correct and coherent with regard to both the variables being kept constant (*My constant would be the five washers, the line, and the size of the balloons. I will use 9 inch round balloons and a fishing line*) and the variable to be changed (*the straws that connect it to the line. I predict the looser the straw is on the fishing line, the farther it will go*). The description in Part B is correct and relevant as to how the variables will be measured (*I will measure the changing variable- which is the straw- by the difference in how far the balloons go. I know this the straw will be the reason for change because it is my only varible that changes*). The description in Part C is thorough with specific information about how the choices of materials may affect the forces acting on the rocket. Holistically, the response is a very good example of complete synthesis and understanding of the complex ideas associated with conducting the investigation.