

New Mexico

QAC PACK



Scoring Institute - 2011



Grade 7
SCIENCE
“Toothpaste” 4 pt

Anchor Set

Packet # _____ Name: _____

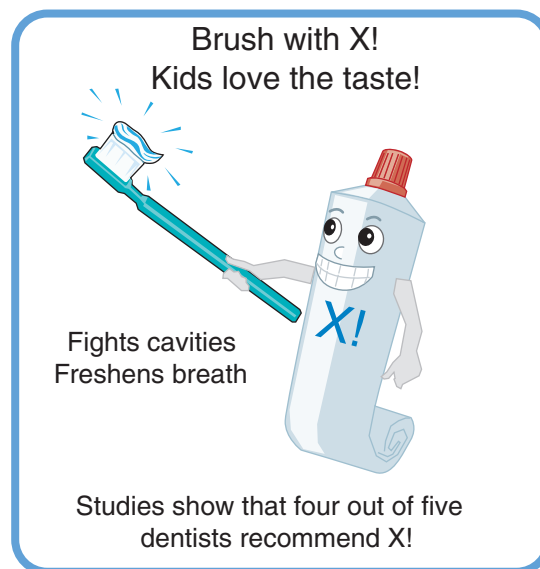
Test Secure

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Researchers at a toothpaste company wanted to do a study to find out whether their brand of toothpaste would be recommended by dentists.

- The researchers asked their own dentists to give out samples of the toothpaste to their clients.
- Both the dentists and their clients filled out questionnaires concerning the quality of the toothpaste.
- The dentists and their clients were paid for filling out the questionnaires.

The results were revealed in the advertisement below.



In your answer document,

- A. Identify a source of bias in this investigation and explain why it is a bias.
- B. Describe 2 ways to improve the investigation that will eliminate sources of bias.

Scoring Rubric

Score	Description
4	The student demonstrates a thorough understanding of how bias can affect scientific investigation and conclusions. The student correctly identifies a source of bias in the investigation and explains why it is bias. The student describes two ways to improve the investigation that will eliminate sources of bias.
3	The student demonstrates an understanding of how bias can affect scientific investigation and conclusions. The student correctly identifies any three of these: a source of bias in the investigation, explains why it is bias, or two ways to improve the investigation that will eliminate sources of bias.
2	The student demonstrates a partial understanding of how bias can affect scientific investigation and conclusions. The student correctly identifies any two of these: a source of bias in the investigation, explains why it is bias, or two ways to improve the investigation that will eliminate sources of bias.
1	The student demonstrates an understanding of how bias can affect scientific investigation and conclusions. The student correctly identifies any one of these: a source of bias in the investigation, explains why it is bias, or one way to improve the investigation that will eliminate sources of bias.
0	The response is incorrect or irrelevant.
Blank	No Response.

Scoring Information:

(A) A source of bias is the researchers asking their own dentists to be part of the study. It is bias because the dentists know the researchers and might be favorable in their responses to the questionnaire.

OR

A source of bias is giving money to the dentists and their clients for filling out the questionnaire. It is bias because the dentists and clients might be favorable in their responses to the questionnaire because they are receiving payment.

(B) Ways to improve the investigation that will eliminate sources of bias include:

- researchers ask a random sample of dentists to test the toothpaste
- researchers do not pay the dentists or clients for filling out the questionnaire
- any other plausible improvement to the investigation to eliminate sources of bias

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Be sure to answer the entire question.

- A. The dentists and their clients were paid for filling out the questionnaires. They are being paid to like the tooth paste.
- B. The researchers could ask more dentists to give out samples. They could also stop paying the dentists and clients.

Annotation: *Response demonstrates an understanding of bias. Part A identifies two sources of bias without explanation. Part B identifies two ways to eliminate the bias.*

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Be sure to answer the entire question.

A. The clients were paid for the study and they used their own dentists to give out samples,

B. They should have used unknown dentists and not paid the people

Annotation: *Response demonstrates a partial understanding. Part A identifies without explanation (asked their dentists, reference to world wide is for B) and part B identifies one way to eliminate bias (dentists across the country).*

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Be sure to answer the entire question.

(A) The researchers asked their own dentists, so it may not be recommended by dentists world wide.

(B) Two ways to improve the investigation are, to give samples to dentists across the country, and to ask more questions.

In Part A, the world-wide applicability is not related to the bias. While it may be a design flaw, it is not answering the question of bias. If they asked world wide dentists, but they were still personal dentists of the researchers, it would still be bias.

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Be sure to answer the entire question.

Ao The reaction of the clients would be a bias because it depends on what the clients think about it and a bias can be an opinion to everyone.

Bo The dentists shouldn't pay their customers for filling out questionnaires and the dentists shouldn't use it, only the clients should.

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Be sure to answer the entire question.

A. A bias is something that researchers have found for kids to use this tooth past. Like fights cavities and freshnes breath.

B. Two way to improve this tooth past. One reason is to Reaserch it twice before using. The second way is add more things to it. For an example shines teeth.

Part B includes a second test. While this may be a way to help improve validity, it is not, own it's own, a method to remove bias.

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Grade 7 **SCIENCE** “Toothpaste” 4 pt

Training Set

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Annotation: *Response demonstrates a partial understanding. Part A identifies payment to fill out a questionnaire. Part B identifies and explains a source of bias and a way to eliminate that bias (ask other dentists because their own would favour them).*

TRAINER A

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Be sure to answer the entire question.

A. The bias in this investigation is that they got paid to fill out a questionnaire and the advertisement said "kids love the taste". Not all the kids will love it.

B.

1. Do not try to state an opinion which is "kids love the taste!"
2. The researchers should ask other dentists, not their own because I of course they will recommend. It's theirs.

An overall look at the response warrants the 3 score. The second statement in Part B covers many of the points. It implies asking their own dentists is bias, and why (It's theirs) and suggests asking other dentists. On the lower end of the 3 score.

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Be sure to answer the entire question.

- a) A source of bias in this explanation is how they paid people to fill out forms. It is bias because if you pay people they are most likely to say you are the best at whatever you do.
- b) Two ways to improve this investigation are not paying people to fill out the forms and to make other dentists give out the samples.

27

Be sure to answer the entire question.

A. The bias part of this ad is the fact that they said kids love the taste. It is bias because not all kids love the taste. And the fact that they said "kids" when anyone can use X.

B. They could say "Brush with X! Feel the exhilarating feeling." Or they could say "Brush with X! You'll love it." or something else that's not bias or that makes more sense.

Seems focused on the "bias" being a marketing to kids, not a bias in the research.

Annotation: *Response demonstrates an understanding of bias. Part A identifies and explains that more than one brand needs to be studied. Part B suggests repeating the study with multiple brands.*

TRAINER D

27

Be sure to answer the entire question.

A. A source of bias in this investigation is that the dentists only tested "X" on their clients; they didn't test any other brand of toothpaste.

B. The dentists could repeat the same process with different brands of toothpaste. This would make the sentence: "Studies show that 4 out of 5 dentists recommend X!" more truthful; it's not like they could recommend anything else!

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Be sure to answer the entire question.

A. It says "Brush with X!" and that they paid the dentists to fill out questionnaires

B. They should get rid of it saying "Kids love the taste" and they should be honest about their product.

Annotation: *Response demonstrates a partial understanding. Part A identifies but doesn't explain payment. Part B identifies not paying participants but larger group is not necessarily a random group.*

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Be sure to answer the entire question.

A, The people who were given the samples got payed,

B, The first you would need to do is give the toothpaste to a larger group. They should not pay the testers either.