Designing questions for student-centered learning

AMISA 2024 Educators' Conference
American School of Asuncion
Asuncion, Paraguay, 21 March, 2024

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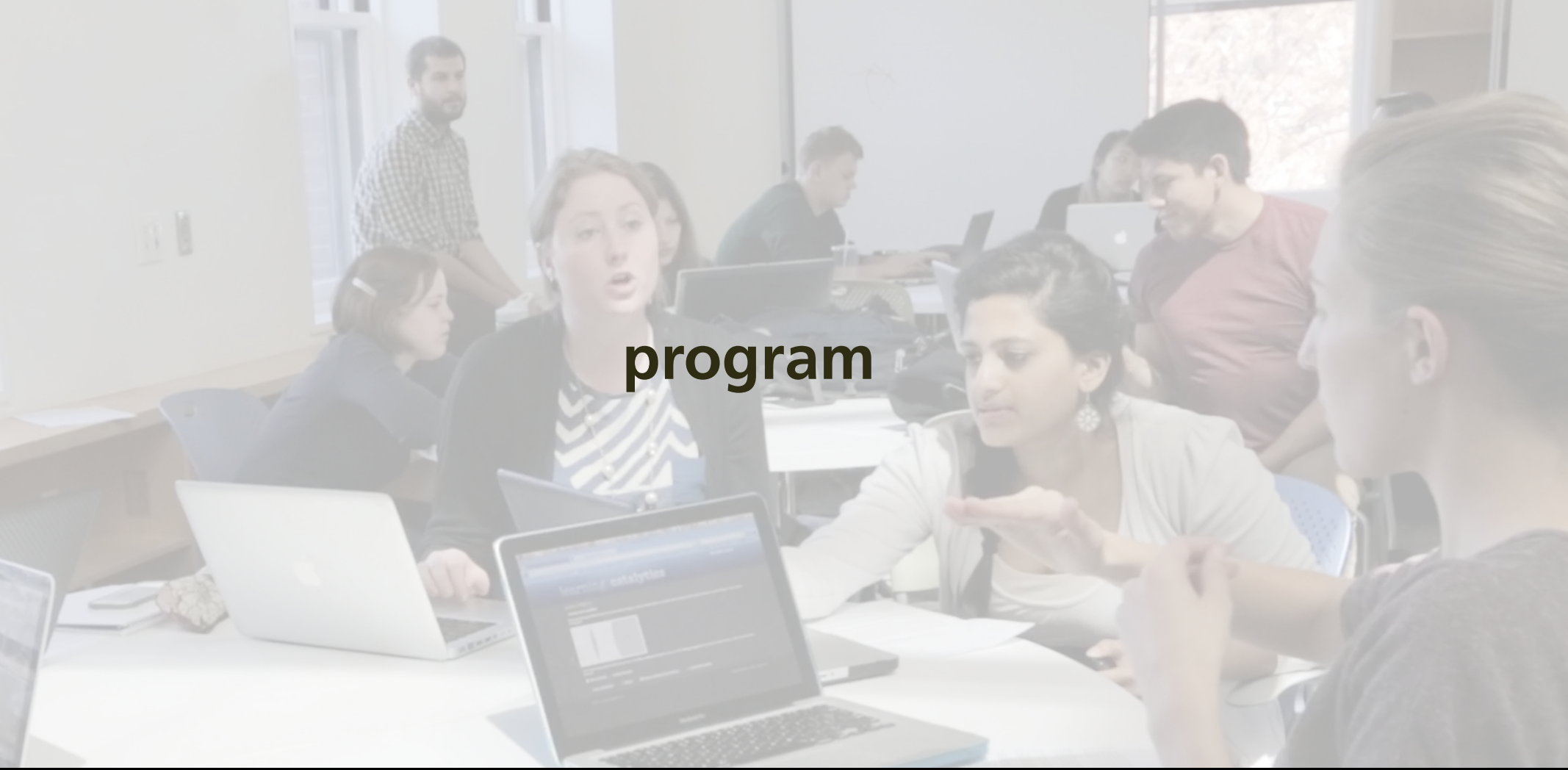
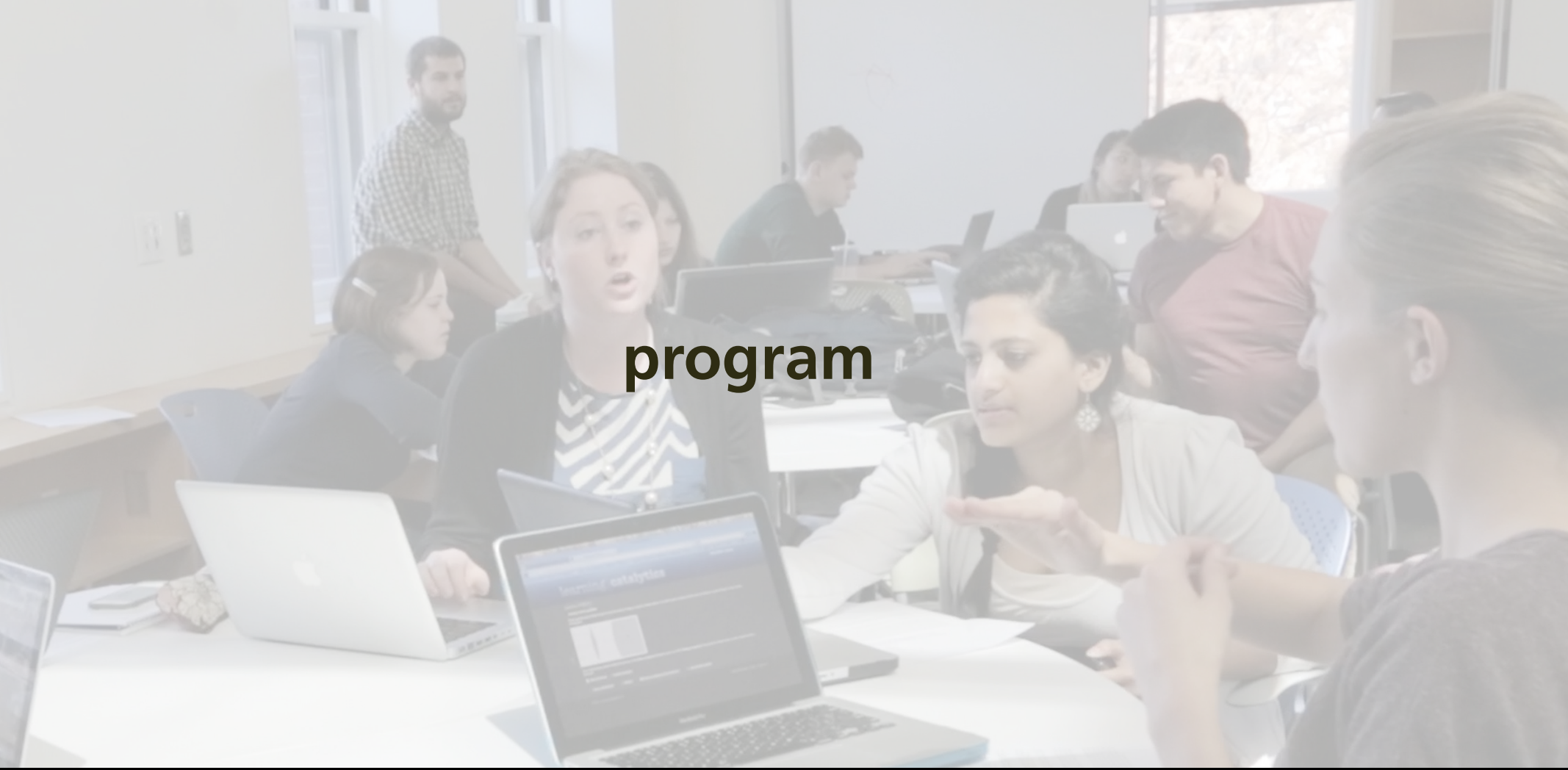


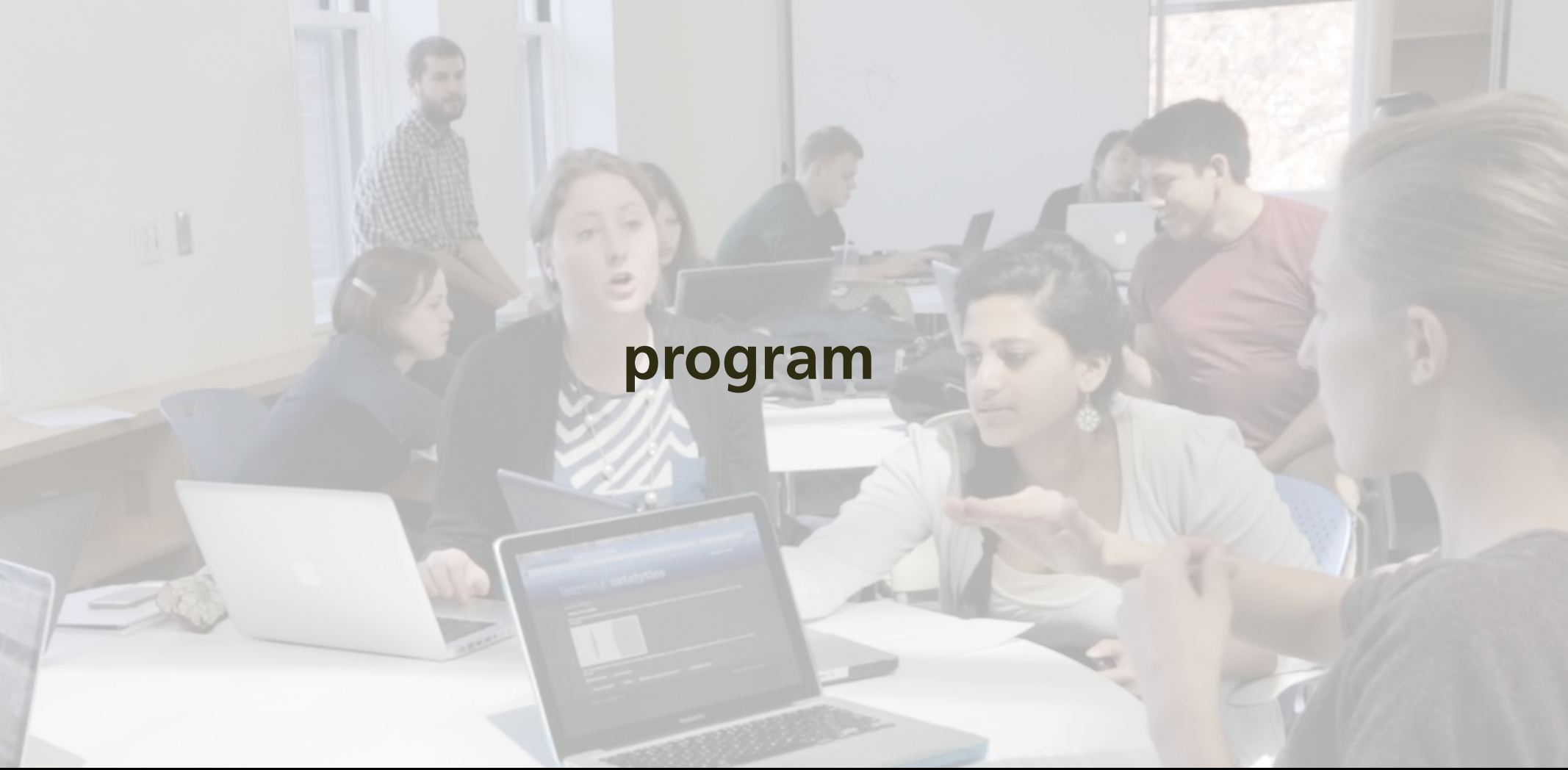
program

1 context



program

1. context
2. classify



program

1 context

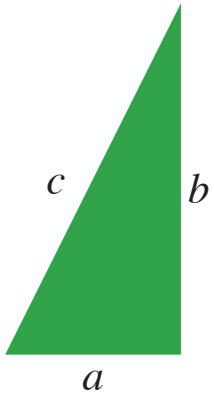
2 classify

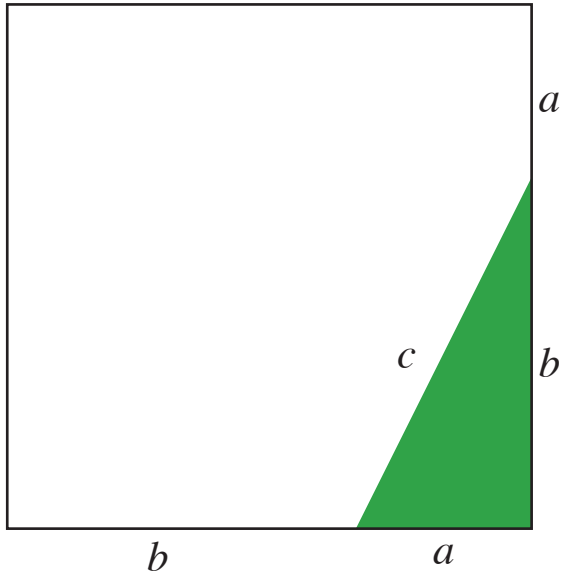
3 improve

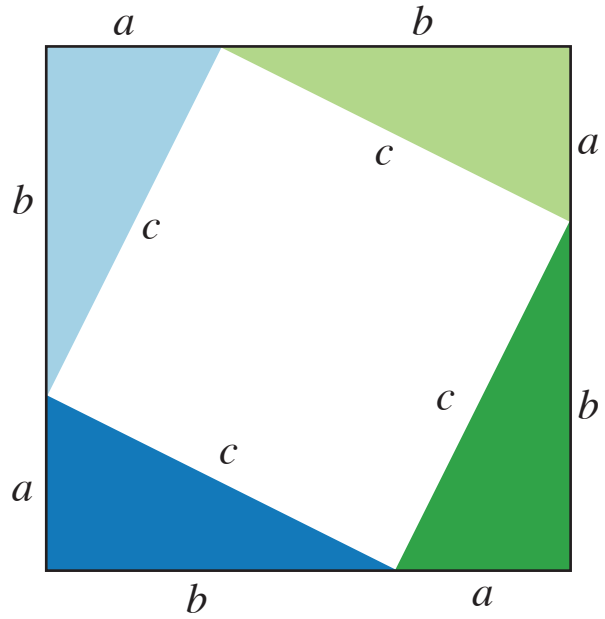
Pythagorean theorem

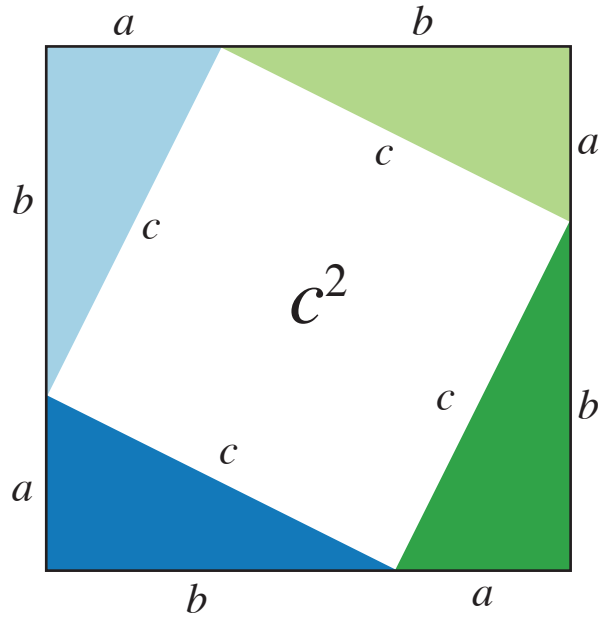
1 context

$$a^2 + b^2 = c^2$$

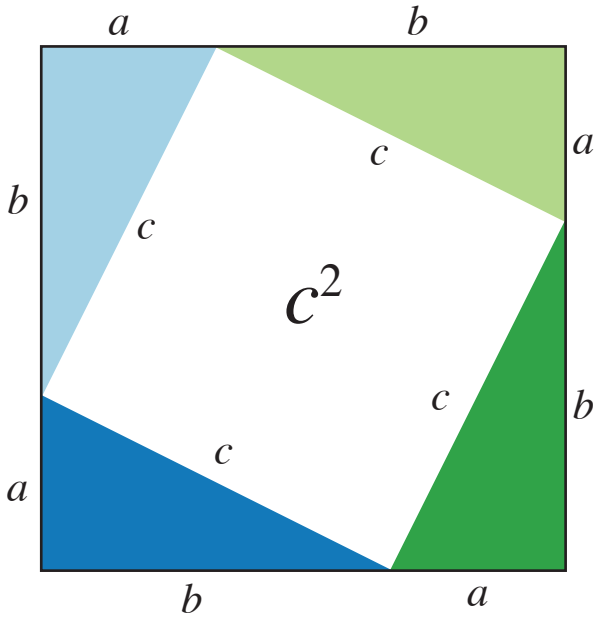


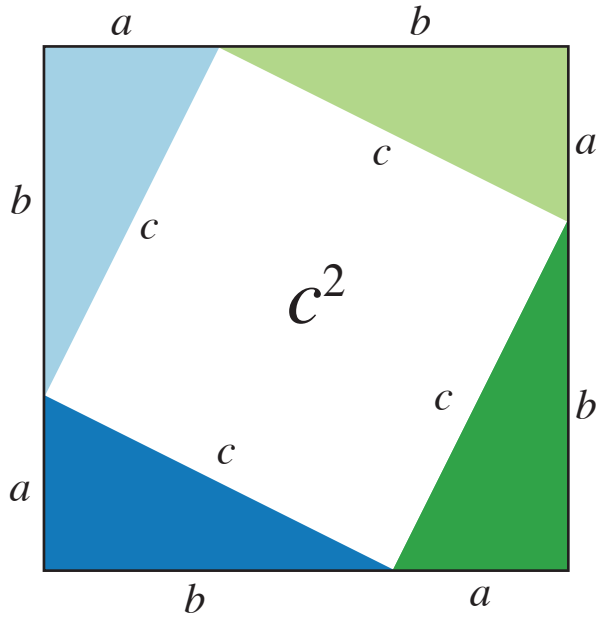

a
c
b
b
a


a
b
a
b
c
c
c
c
b
a
b
a

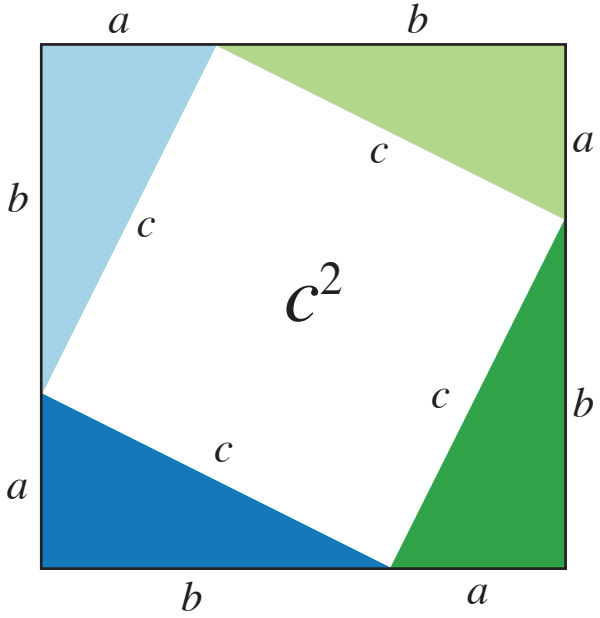


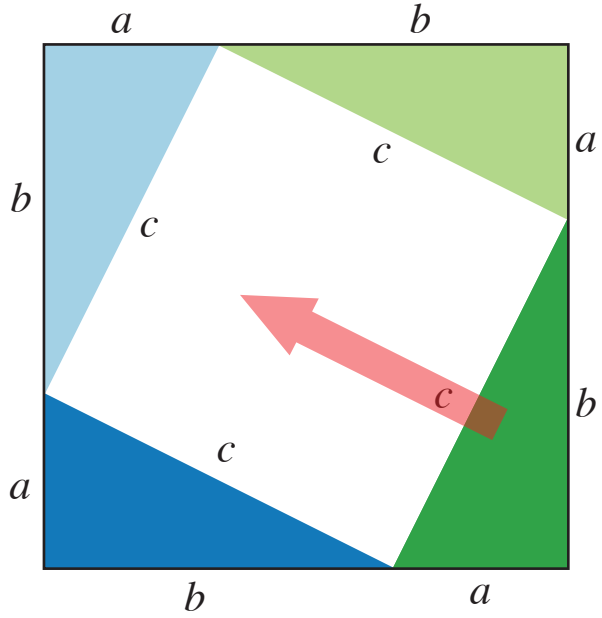
1 context





1 context





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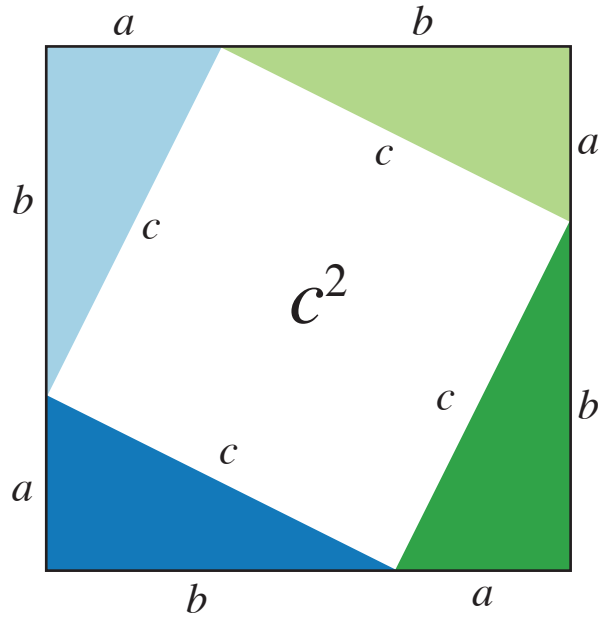

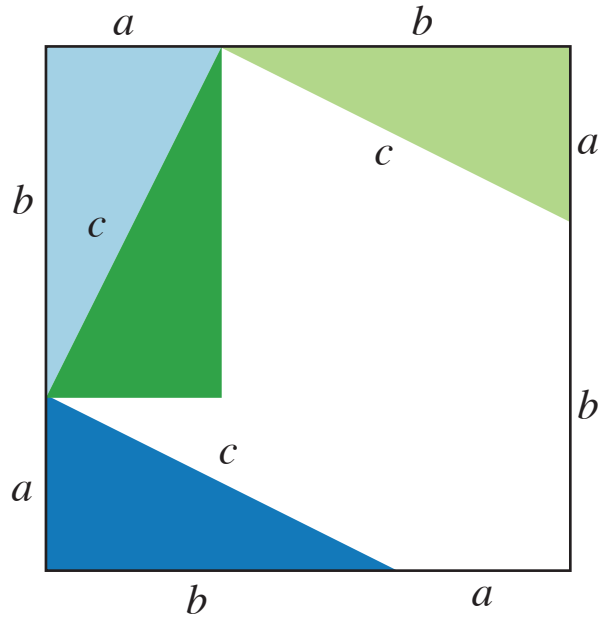

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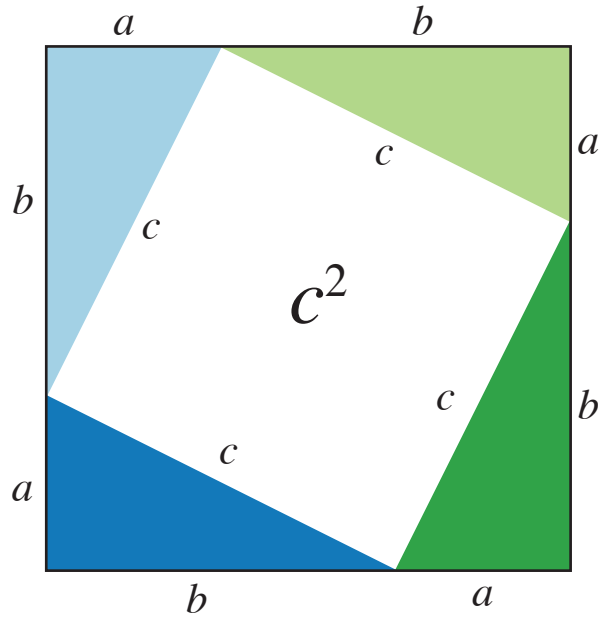
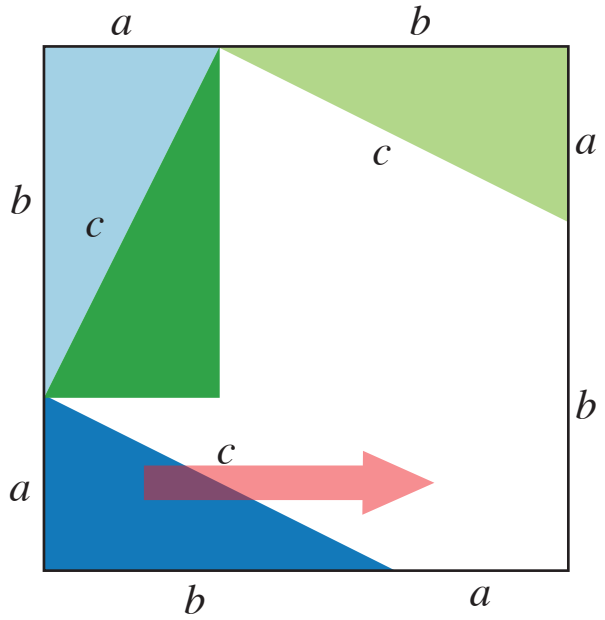
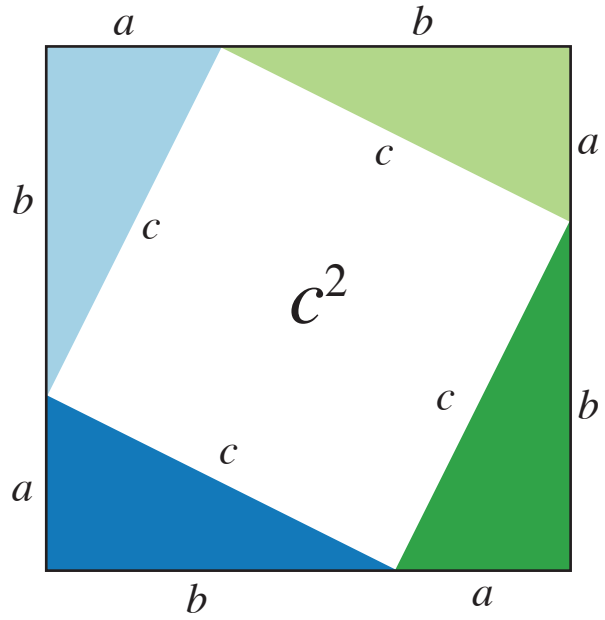
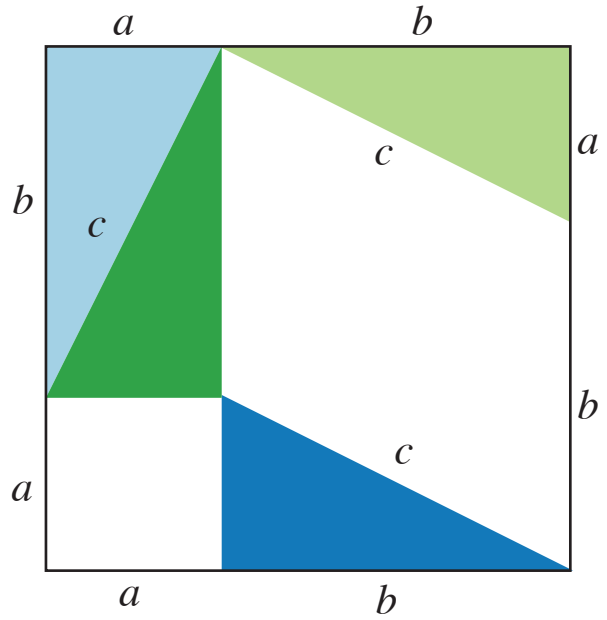


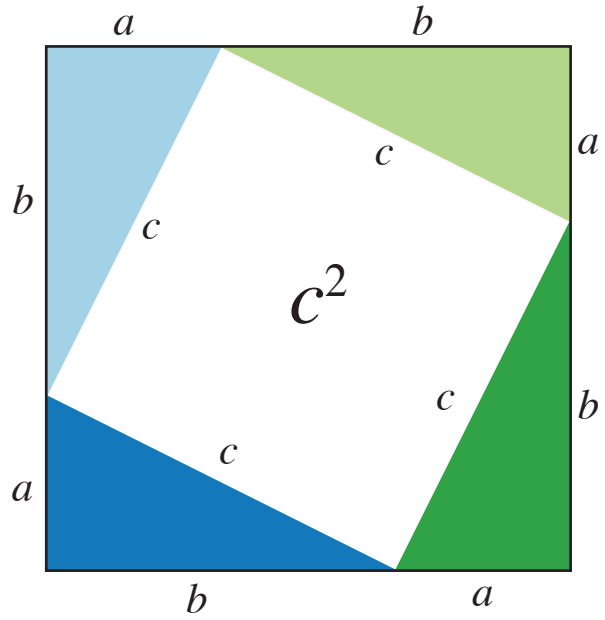


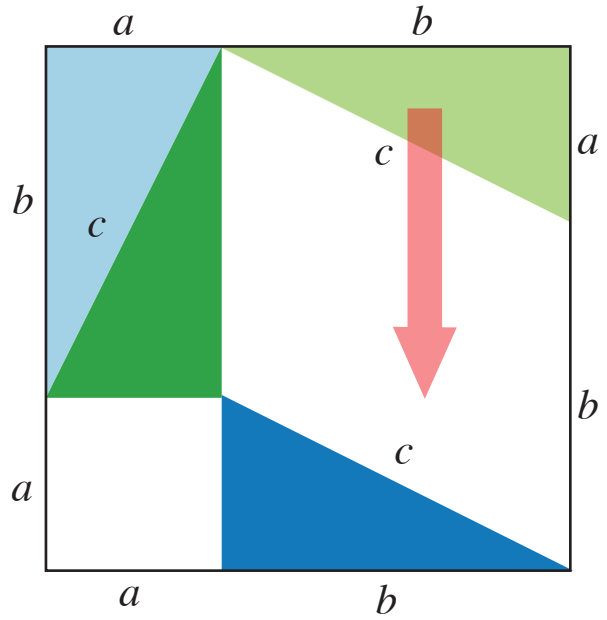
1 context





1 context





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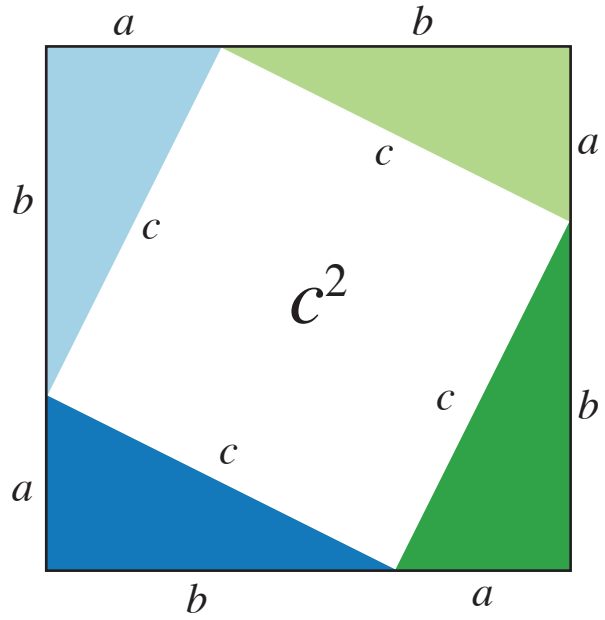

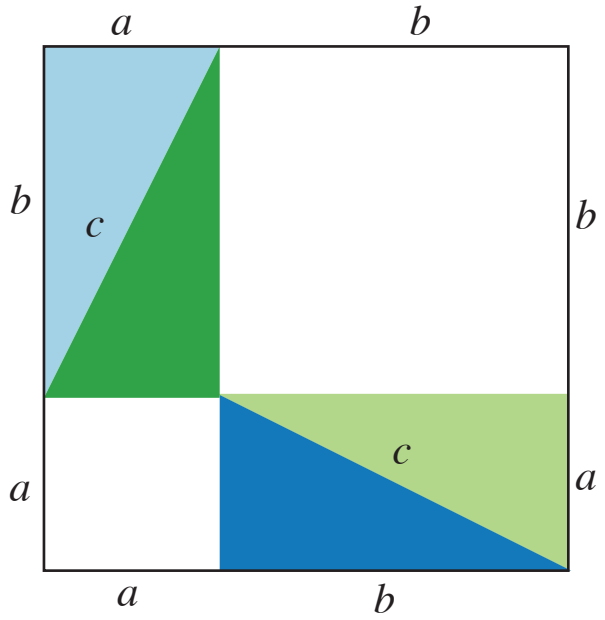

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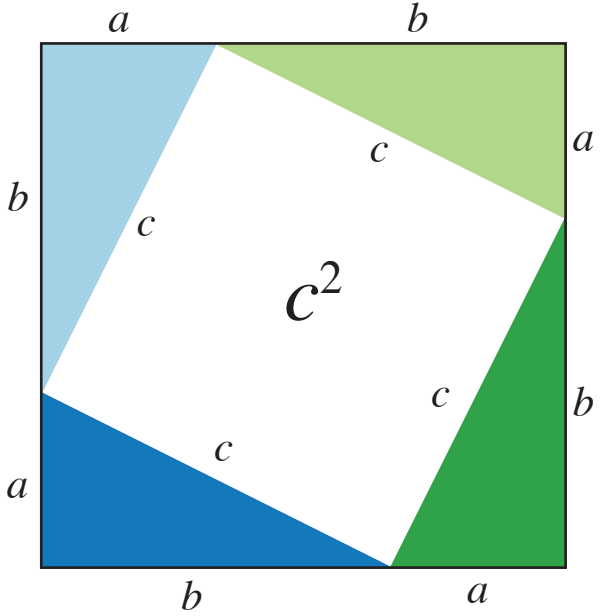

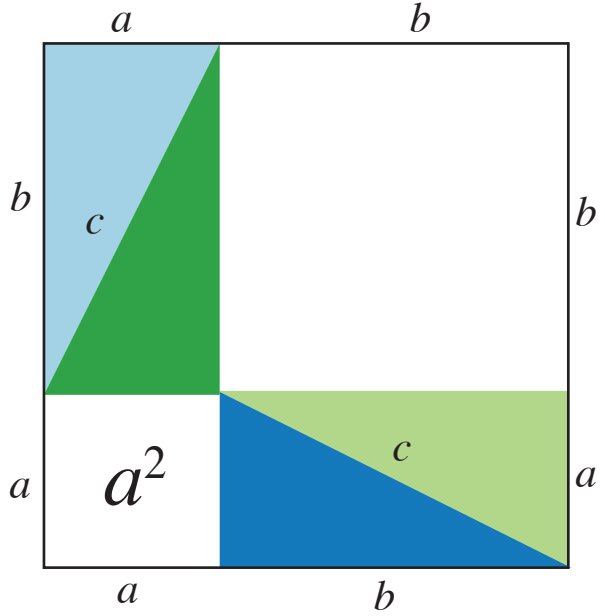

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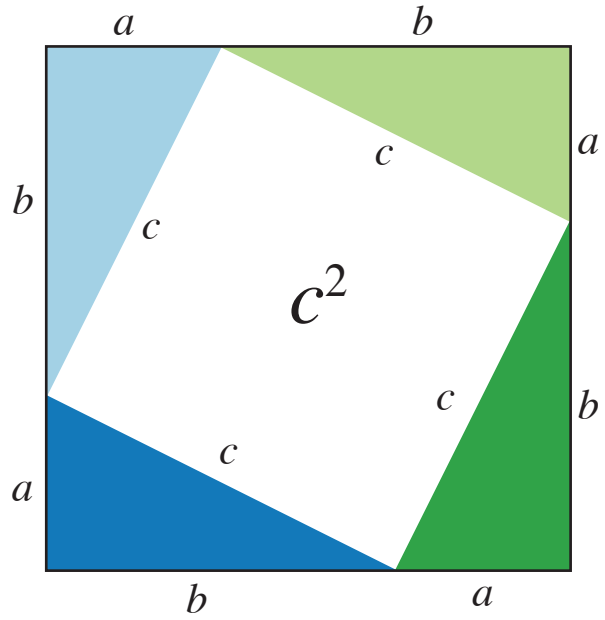
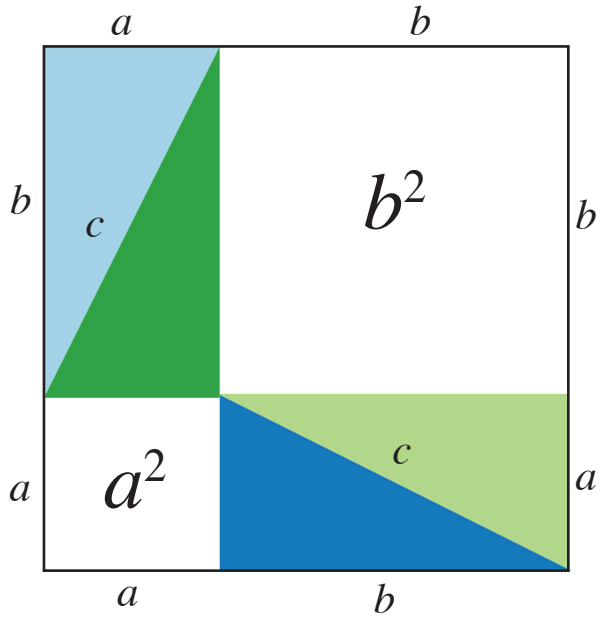
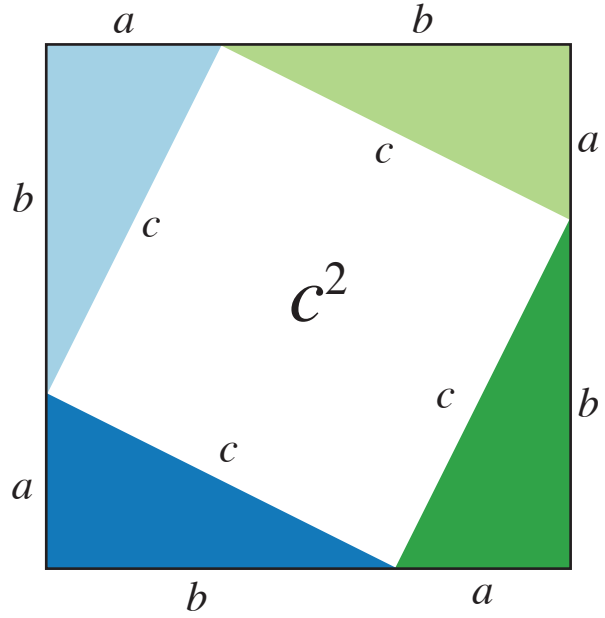
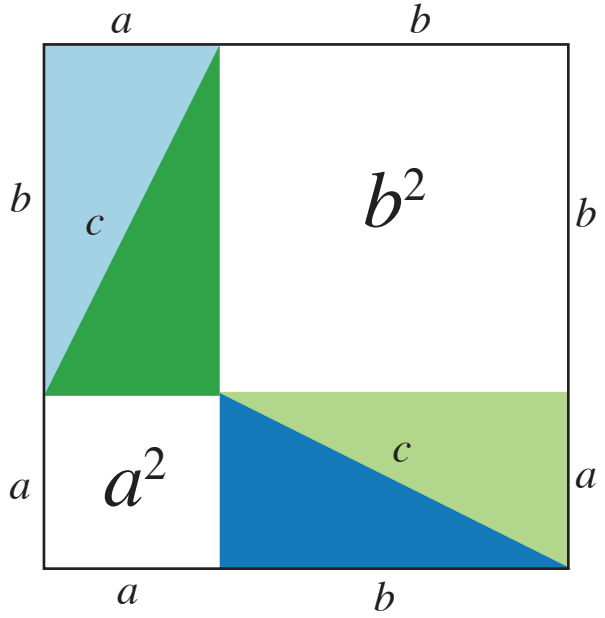


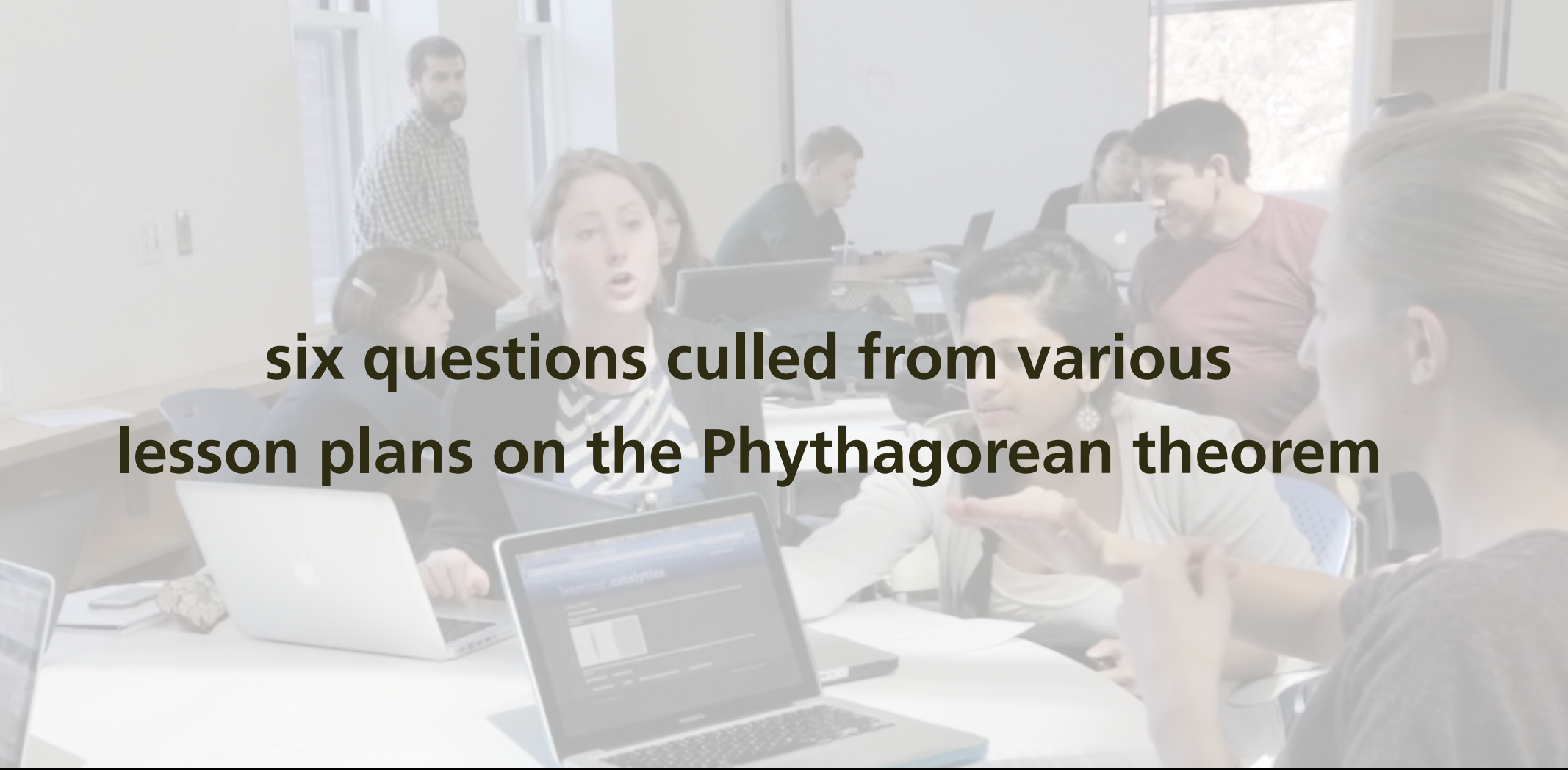


1 context

$$a^2 + b^2 = c^2$$







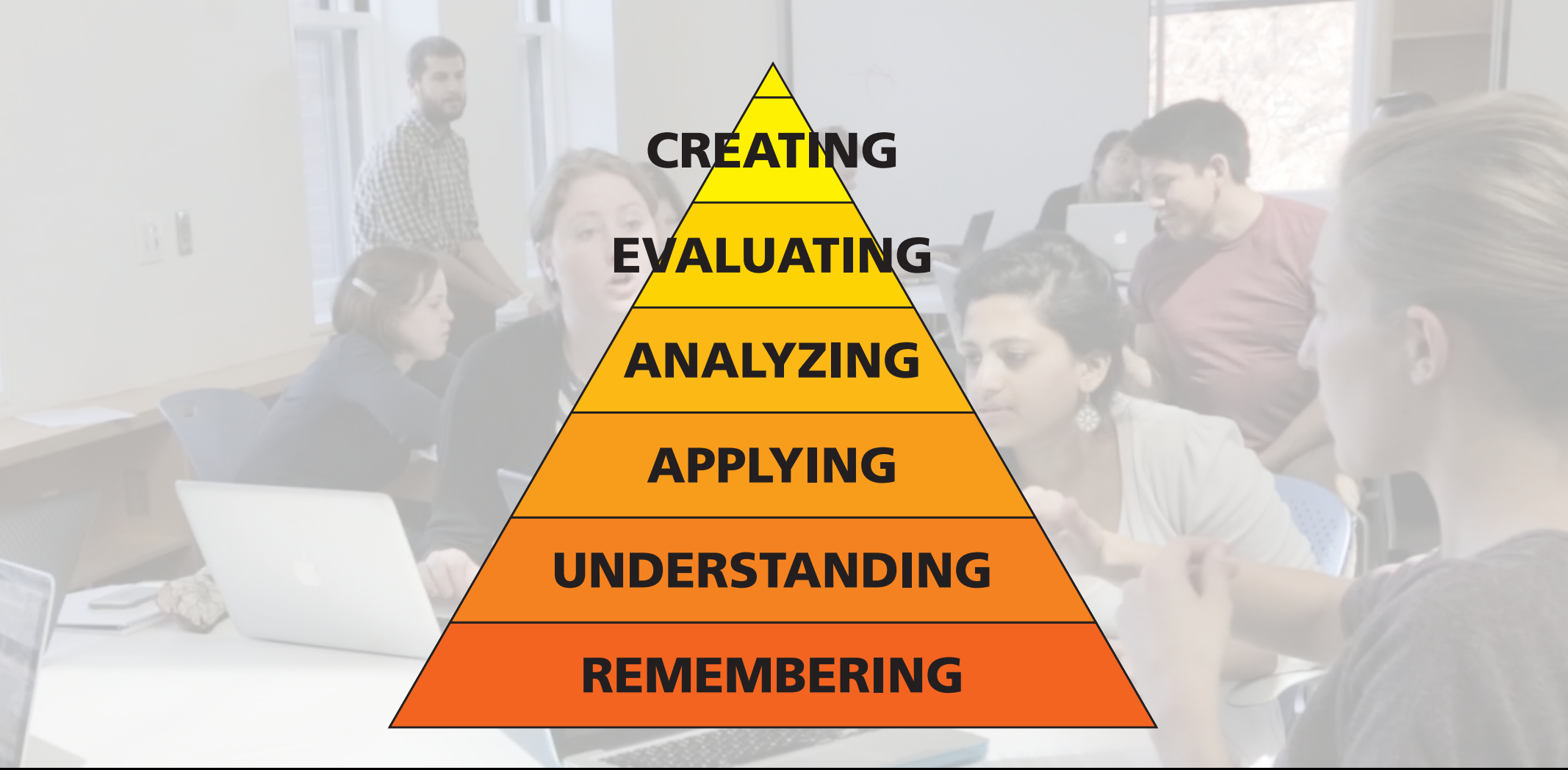
six questions culled from various lesson plans on the Phythagorean theorem

1 context

task: classify them using Bloom's taxonomy

1 context

2 classify



1 context

2 classify

use this link to see, classify, and rank the six questions

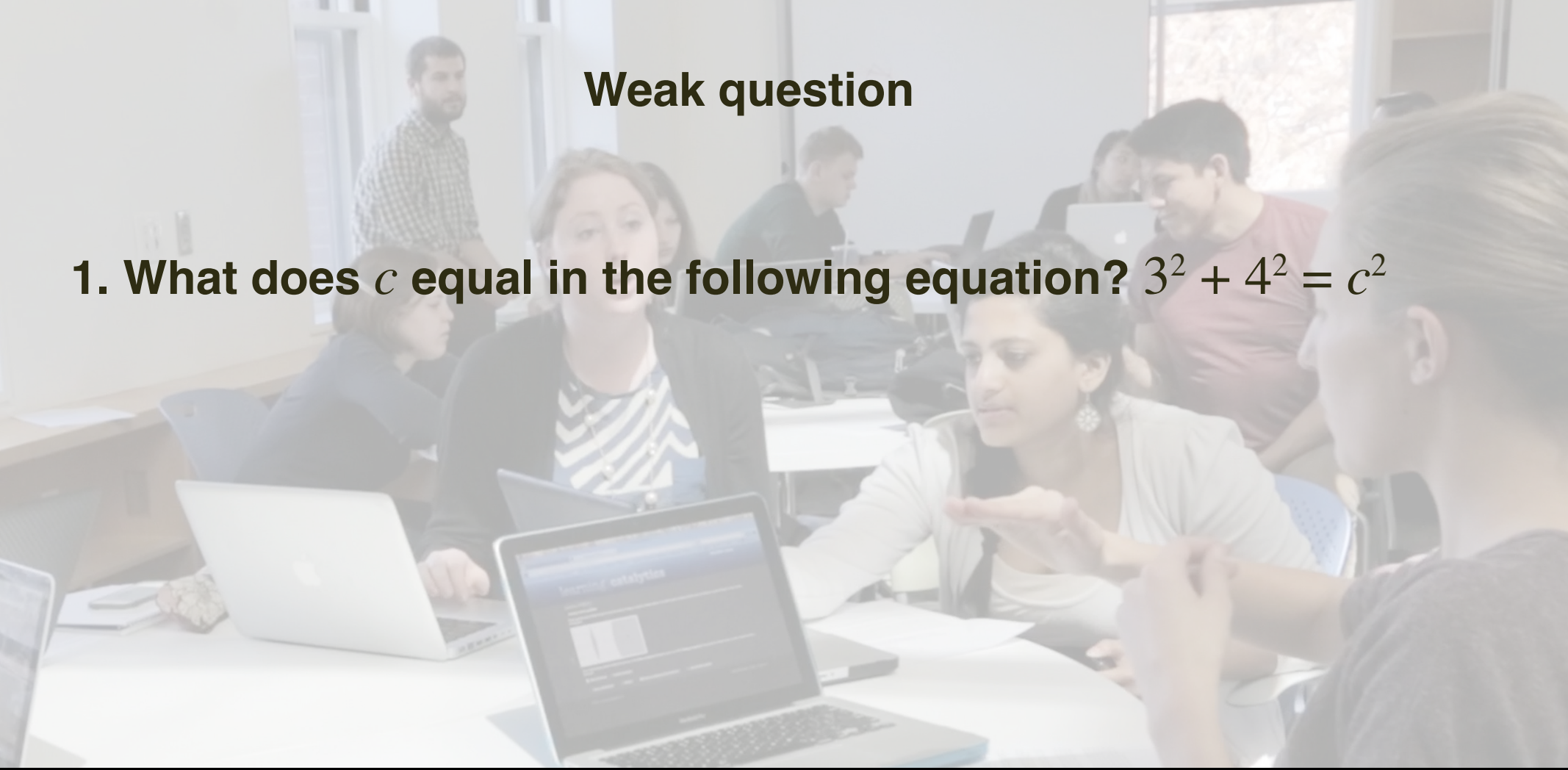
http://bit.ly/qw_rank

1 context

2 classify

Weak question

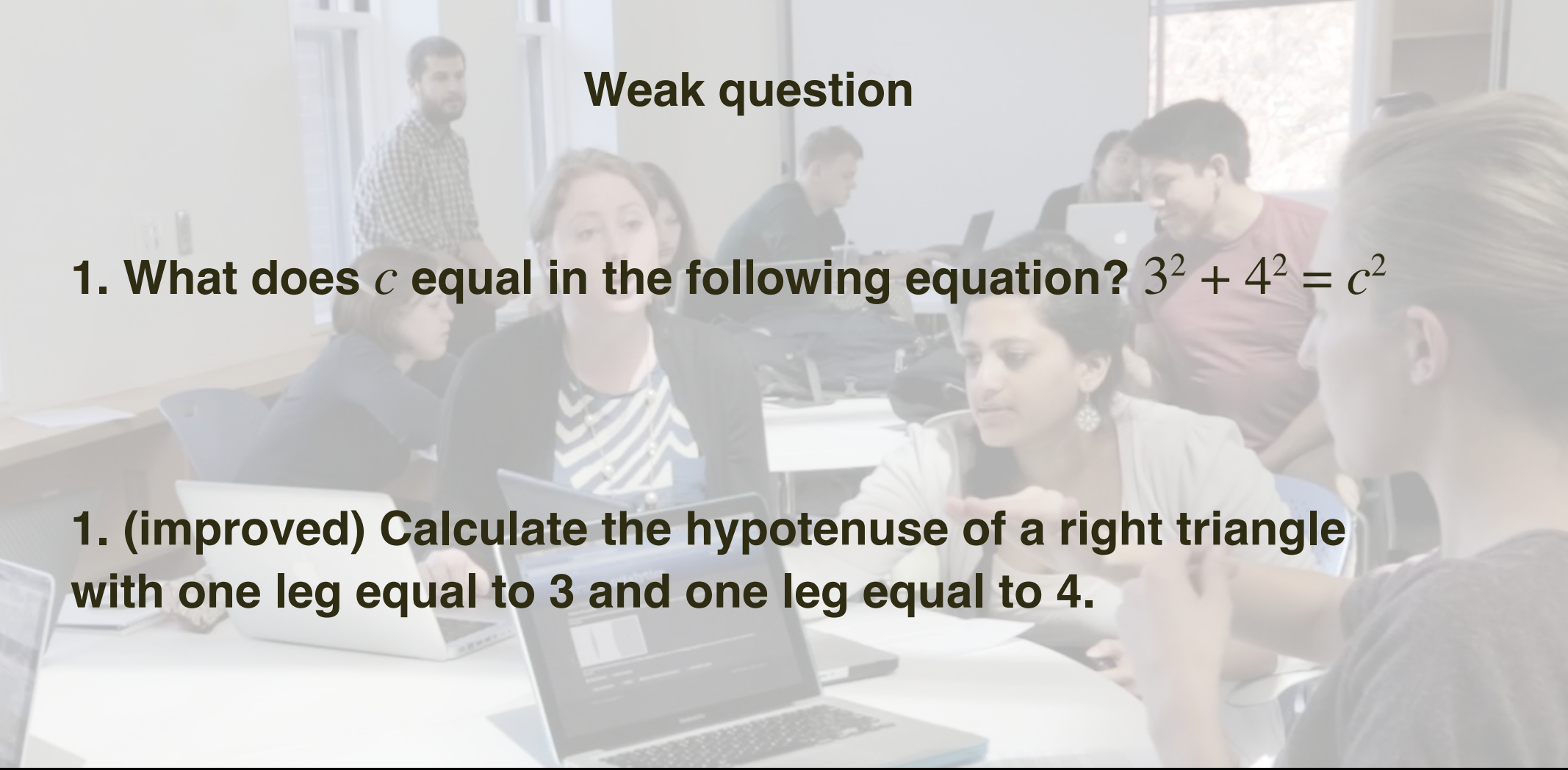
1. context
2. classify



Weak question

1. What does c equal in the following equation? $3^2 + 4^2 = c^2$

1. context
2. classify



Weak question

1. What does c equal in the following equation? $3^2 + 4^2 = c^2$

1. (improved) Calculate the hypotenuse of a right triangle with one leg equal to 3 and one leg equal to 4.

1 context

2 classify

Weak question

5. Which of the following is the Phytagorean theorem?

a) $a + b = c$

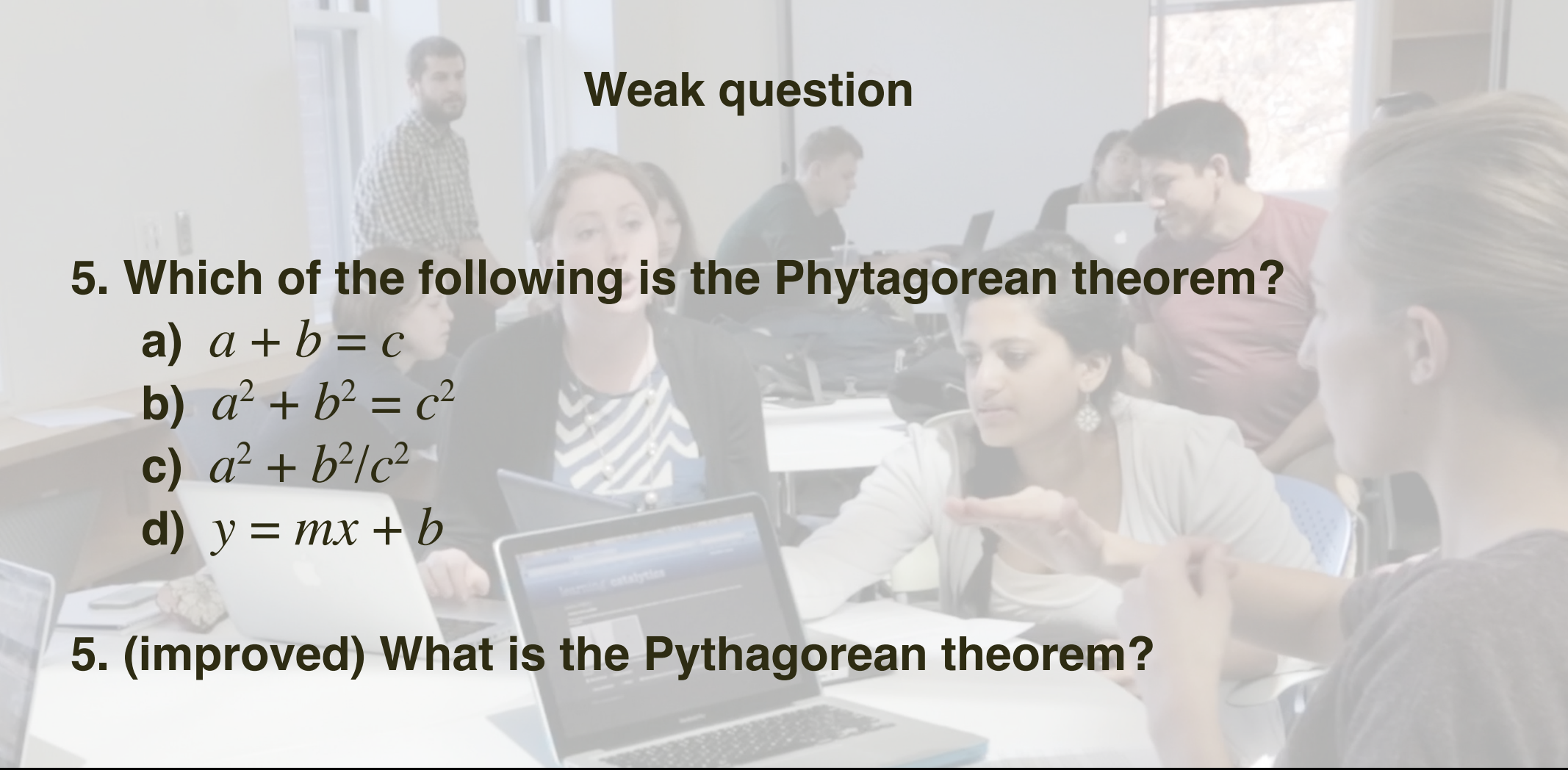
b) $a^2 + b^2 = c^2$

c) $a^2 + b^2/c^2$

d) $y = mx + b$

1 context

2 classify



Weak question

5. Which of the following is the Phytagorean theorem?

a) $a + b = c$

b) $a^2 + b^2 = c^2$

c) $a^2 + b^2/c^2$

d) $y = mx + b$

5. (improved) What is the Pythagorean theorem?

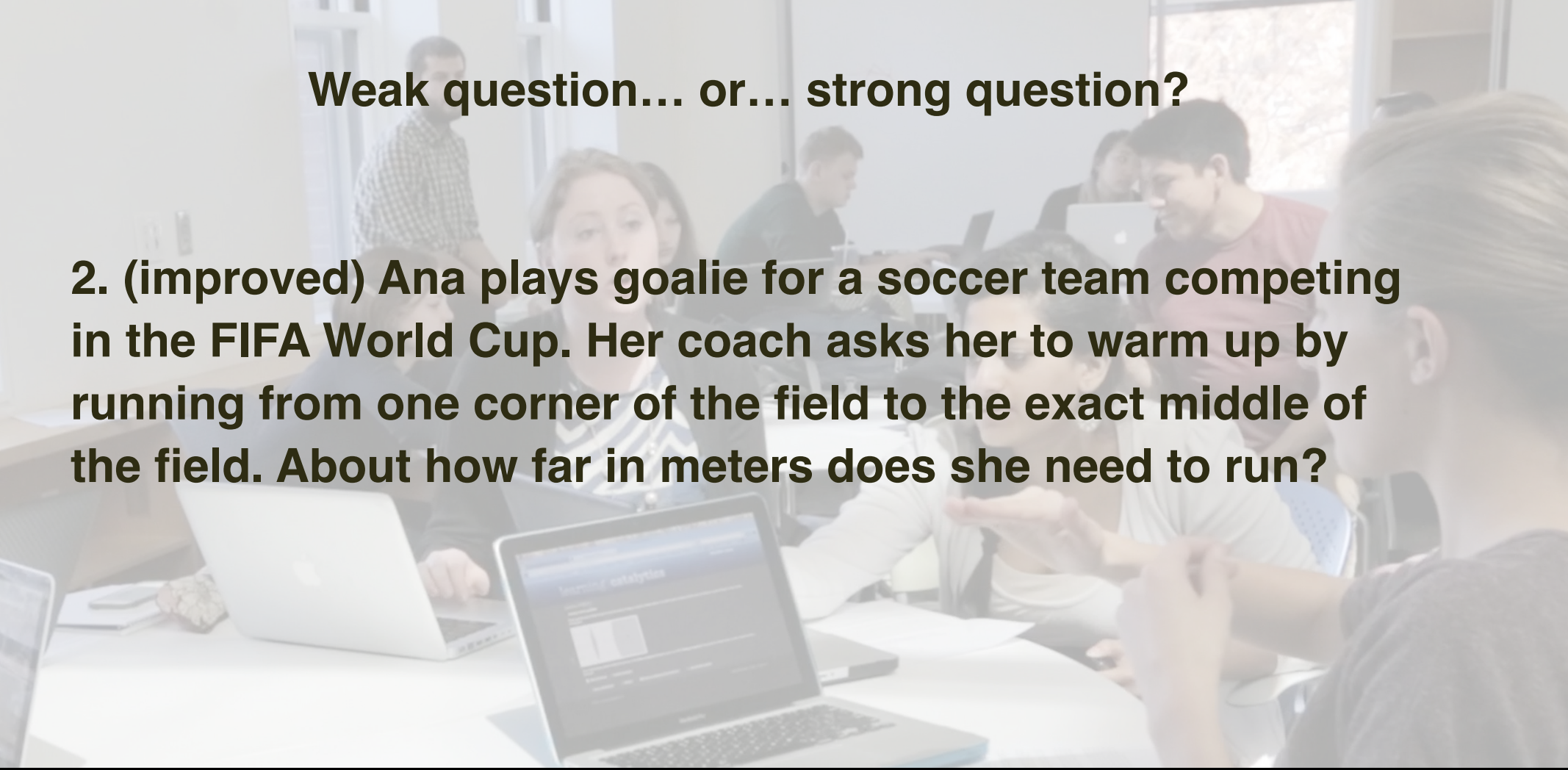
1 context 2 classify

Weak question… or… strong question?

2. Ana plays goalie for a soccer team competing in the FIFA World Cup. Her coach asks her to warm up by running from one corner of the field to the exact middle of the field. About how far does she need to run?

a) 13 m
b) 66 m
c) 110 m
d) 185 m

1 context 2 classify



Weak question… or… strong question?

2. (improved) Ana plays goalie for a soccer team competing in the FIFA World Cup. Her coach asks her to warm up by running from one corner of the field to the exact middle of the field. About how far in meters does she need to run?

1 context 2 classify

Strong question

3. To get from his high school to his home, Brian travels 5.0 miles east and then 4.0 miles north. When Jasmine goes to her home from that same high school, she travels 8.0 miles east and 2.0 miles south. What is the approximate measure of the shortest distance between Brian's home and Jasmine's home?

1 context

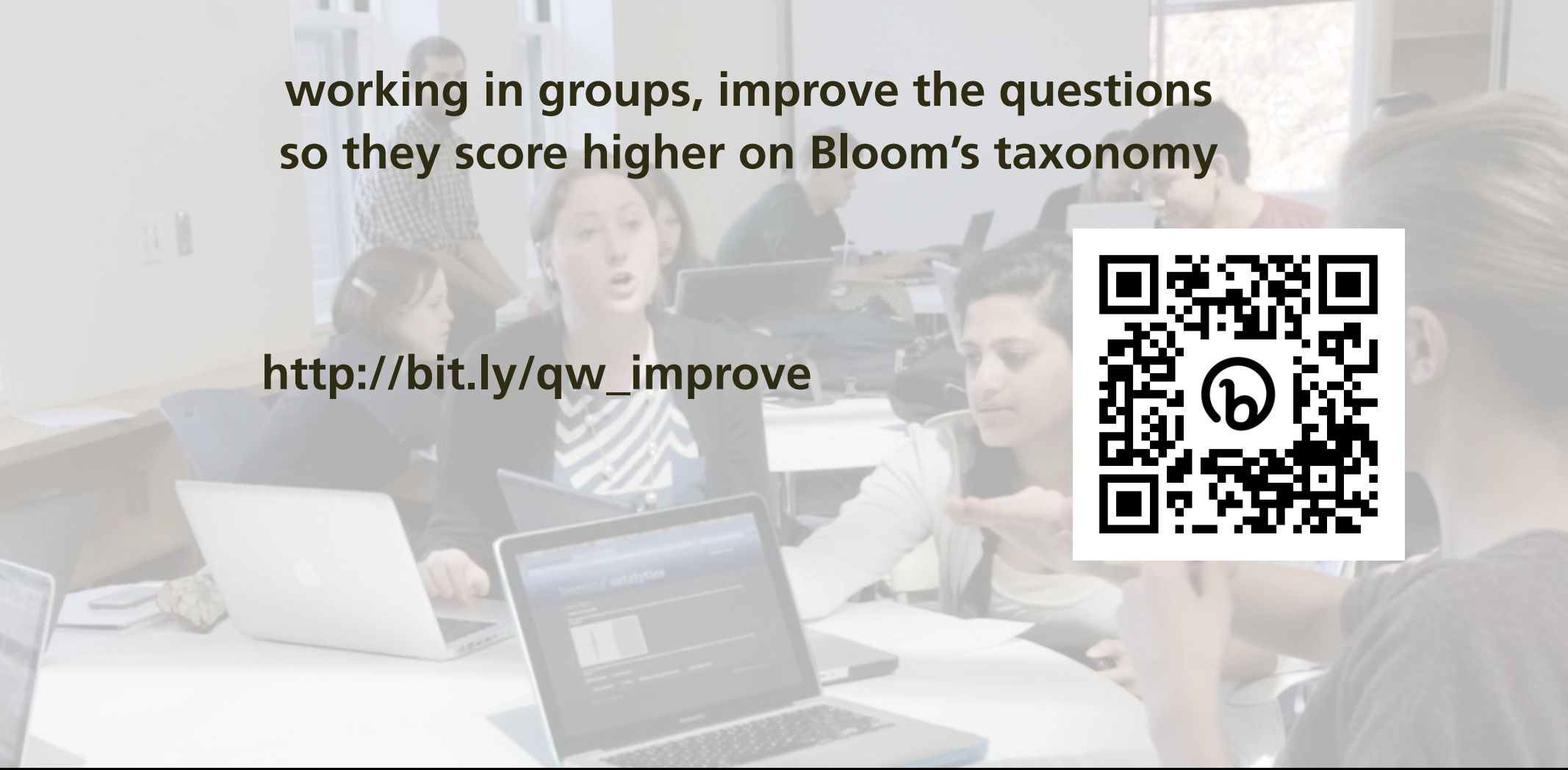
2 classify

task: improve each of the six questions

1 context

2 classify

3 improve



working in groups, improve the questions
so they score higher on Bloom's taxonomy

http://bit.ly/qw_improve

1 context 2 classify 3 improve

here is a copy of my analysis

http://bit.ly/qw_analysis

1 context 2 classify 3 improve

what are *your* questions testing?

summary of links from this workshop

http://bit.ly/qw_links

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mazur.harvard.edu

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