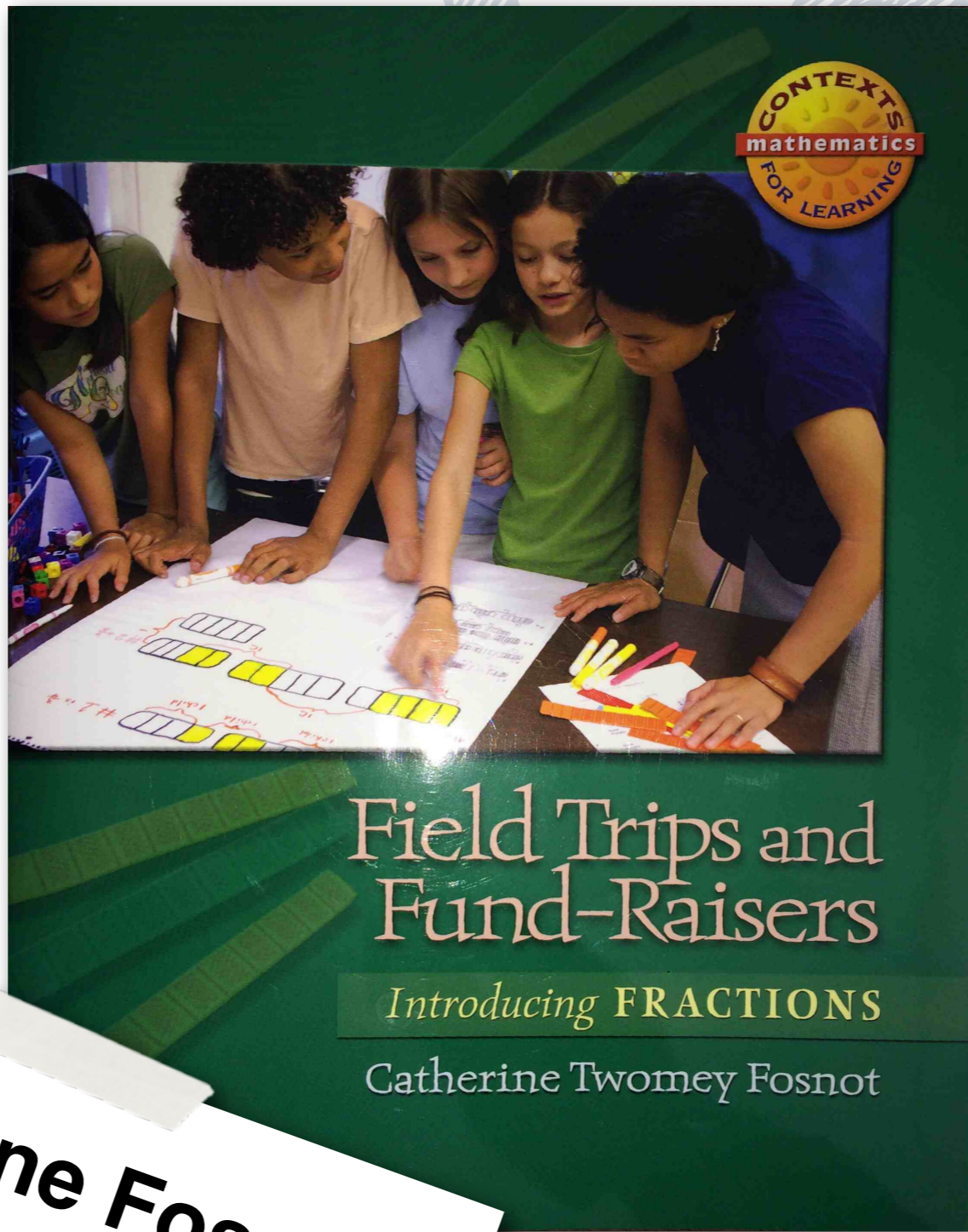developing perseverance, critical thinking, and communication using...

NONSTANDARD PROBLEMS

WHERE IT ALL BEGAN

CONTEXTS
mathematics
FOR LEARNING

Field Trips and
Fund-Raisers

Introducing FRACTIONS

Catherine Twomey Fosnot

Catherine Fosnot

Roberta
Virginia

Strate

Work—

Explain—

Conclution→

1 ch

I

Charlie.f

Submarines

Written By:

So first we split every sub into $\frac{1}{2}$'s so we have 34 subs.

So every person gets half a sub with 12 half subs extra.

So we split each half sub in half giving us 24 quarter subs.

Than you give every body a quarter sub and feed 2 quarter subs to the pigeons

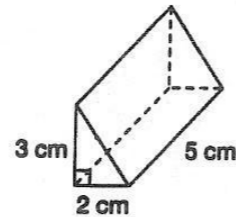# NOW WHAT?
MAKING A PLAN

ritical thinking and
verance are not i

THE JOURNEY TO NONSTANDARD PROBLEMS

Code 10

Jackie fills the triangular prism pictured below with water. Then she empties the water into a rectangular prism.

3 cm   5 cm

2 cm

Determine the number of times that Jackie must fill the triangular prism with water to fill a rectangular prism that is 10 cm long, 2 cm wide and 12 cm high.
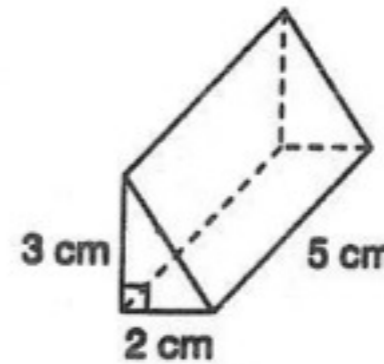
Justify your answer.

A	length	Width	Area
B	5	3	15
C	5	3	15
D	2	3	6
E	2	3	6
			42cm³

Annotation:
Student demonstrates too much emphasis on unimportant elements of the problem; attempts to
the surface area of the triangular prism (disregarding one face) using length and width.
Question incomplete.

6MV2   Students will determine the relationship among units and measurable attributes, including the area
of a parallelogram, the area of a triangle, and the volume of a triangular prism.

If we wanted our students to be critical thinkers, we needed them to be able to identify the questions they were being asked to answer.

'SNAPPING' THE QUESTION

THE RESEARCH OF MICHAEL HARDT (ROCHESTER, NY)

What colour is Bridget's hair?

In which year did the film Grease originally appear in theaters?

How many ml in a U.S. pint of beer?

A JUGGLER KEEPS THREE APPLES, FOUR ORANGES, AND SEVEN PEARS IN THE AIR AT ANY GIVEN TIME. HOWEVER, DURING A PERFORMANCE HE DROPS EIGHT PIECES OF FRUIT ON THE GROUND. HOW MANY POSSIBLE COMBINATIONS OF FRUIT REMAIN FOR HIM TO JUGGLE?

LIST ALL THE POSSIBLE COMBINATIONS OF APPLES, ORANGES AND PEARS LEFT IN THE AIR

THREE APPLES, FOUR ORANGES, AND SEVEN PEARS IN THE AIR EIGHT PIECES OF FRUIT ON THE GROUND

CREATING THE CONDITIONS FOR REFLECTION

cognitively frugal

THINKING, FAST AND SLOW

DANIEL KAHNEMAN
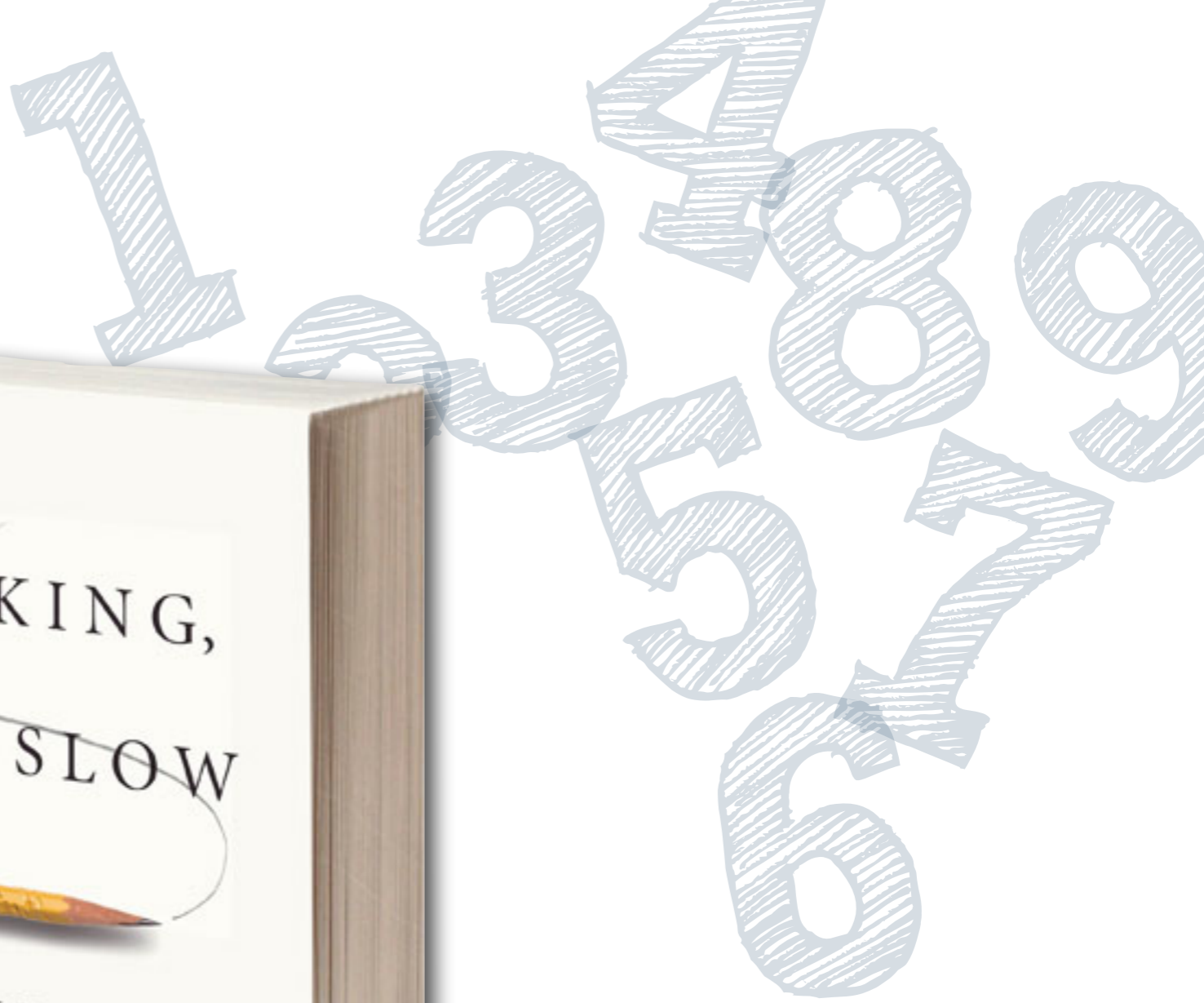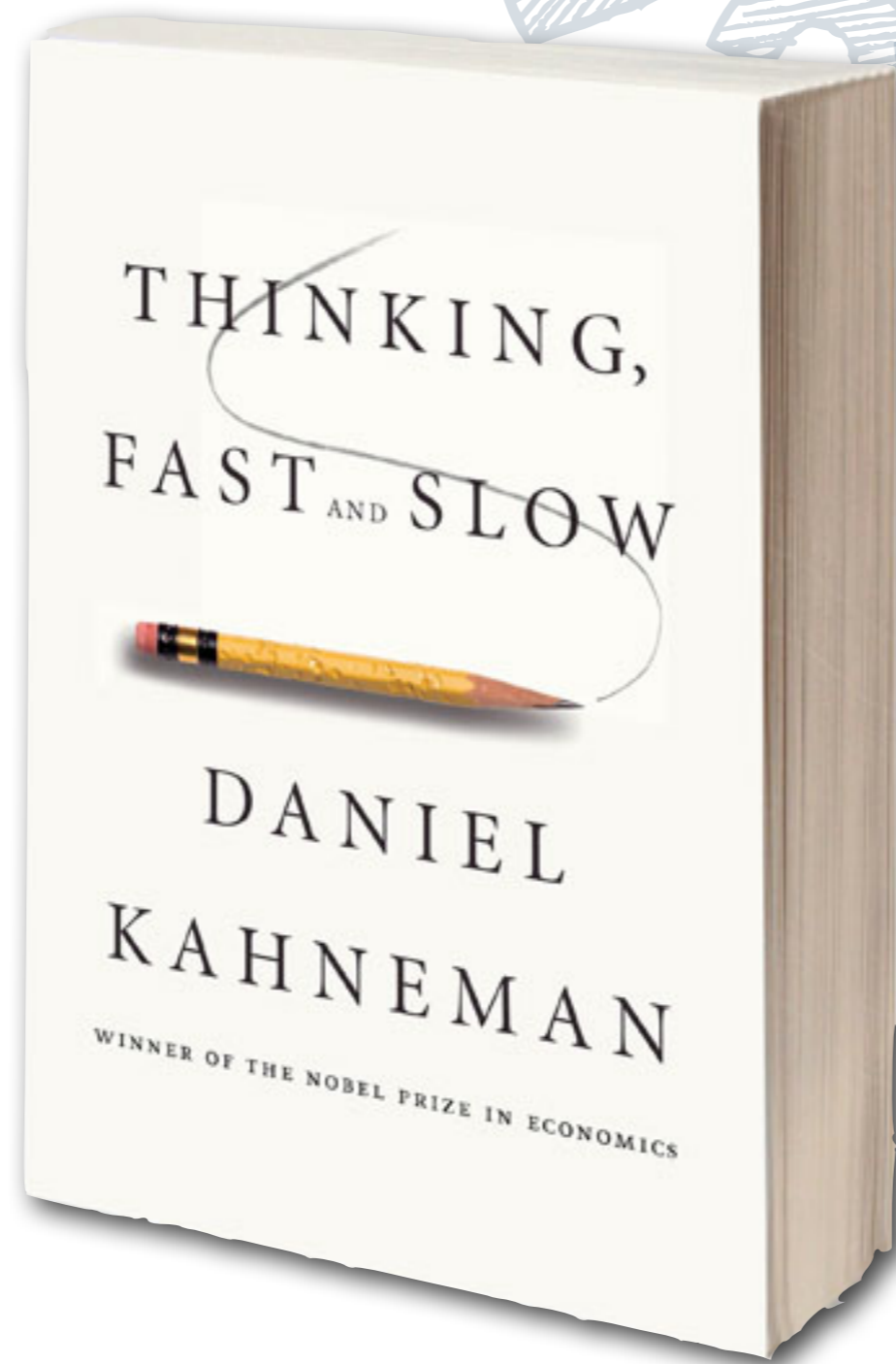
SLOWING THE THINKING DOWN...

- What question do you think you are investigating?

- Do you have enough information to answer this question?

- What additional information do you need?

- What is your prediction?

- Why does this sound reasonable to you?

OLD EBBITT GRILL
Since 1856

10997 Sam K

Tb! 201/1   Chk 4045   Gst 5
             Dec21'12 05:23PM

1 Yuengling Pint   6.40
2 Beverage   6.00
2 __DOZEN__   51.90
24 ____Oysters____   0.00
2 _____   0.00
1 Calamari   10.50
12 Jumbo Shrimp   36.00
1 Small Caesar Sal   4.00
1 Autumn Platter   16.50
1 5oz Filet Mignon   19.95
1 Pumpkin Ravioli   16.95
1 8oz Filet Mignon   25.95
1 Seafood Salad   16.95
1 Bldy Maryland Absolut   13.00
Pepper

Subtotal   224.10
Tax   22.41
07:05PM Total   246.51

New Year's Eve 2012
Join us for annual
all-inclusive Casino Royale
event. Tickets are $125 until
11/30, then $140 until 12/31.
Tickets at: www.ebbitt.com

The longer that a student spends considering what the question is, or how they plan to approach the problem, the more invested they become in reaching the solution to the problem.

TRADITIONAL ALGORITHM

3 + 8 + 12 = ?

WORD PROBLEM

Bridget gives 3 pencils to her students in her period one class, 8 pencils to her period 2 class, and then shakes her head as she hands out 12 more pencils over the course of the afternoon.

The animals at the zoo were playing on the teeter-totter.

The first time they played there were five clowns on one side, and six monkeys on the other side. The teeter-totter was evenly balanced.

The second time they played there was a zebra on one side. On the other side there was one clown and four monkeys. The teeter-totter was evenly balanced.

The third time they played there was a zebra and two monkeys on one side. On the other side, there were six monkeys. What happened with the teeter-totter this time?

WHICH NUMBER DOESN'T BELONG?

1919

1990

1991

9191

PUTTING IT ALL TOGETHER

B L U E

BREAK

BREAK THE QUESTION INTO *GIVEN* AND *REQUESTED*
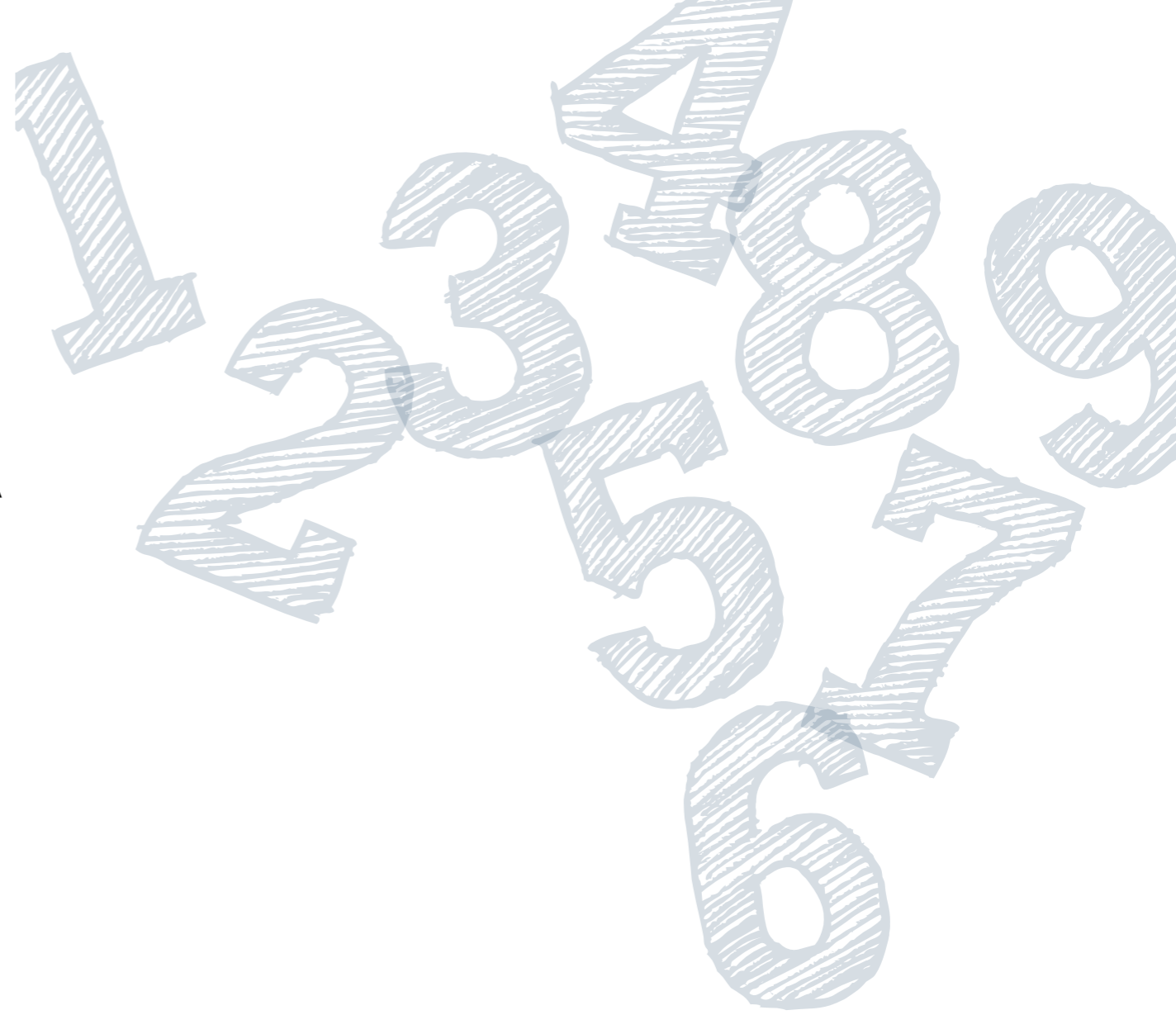
LIST

LIST THE STRATEGY YOU WILL USE TO SOLVE THE QUESTION

USE
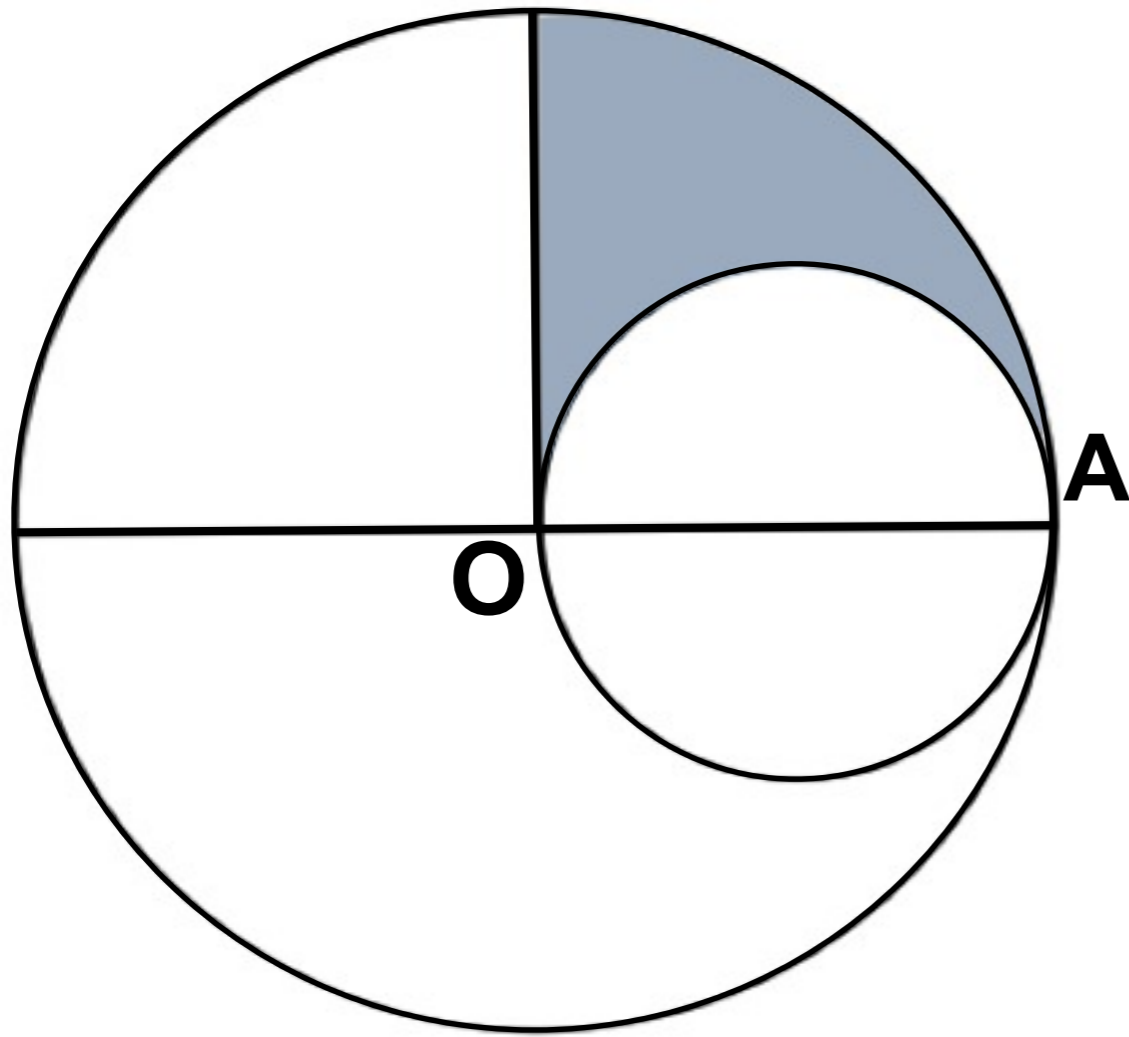
USE THE STRATEGY (a.k.a., DOING THE MATH)

EVALUATE

EXPLAIN WHAT YOU DID, WHY YOU DID IT AND HOW IT WORKED OUT

A GOOD QUESTION WILL REQUIRE A STUDENT TO GO DEEPER, MAKE CONNECTIONS, EXPLORE THE EFFECTIVENESS OF STRATEGIES, ETC.

What is the area of the shaded region in the following diagram? The only information you are gives is that the line segment OA is 6 units.
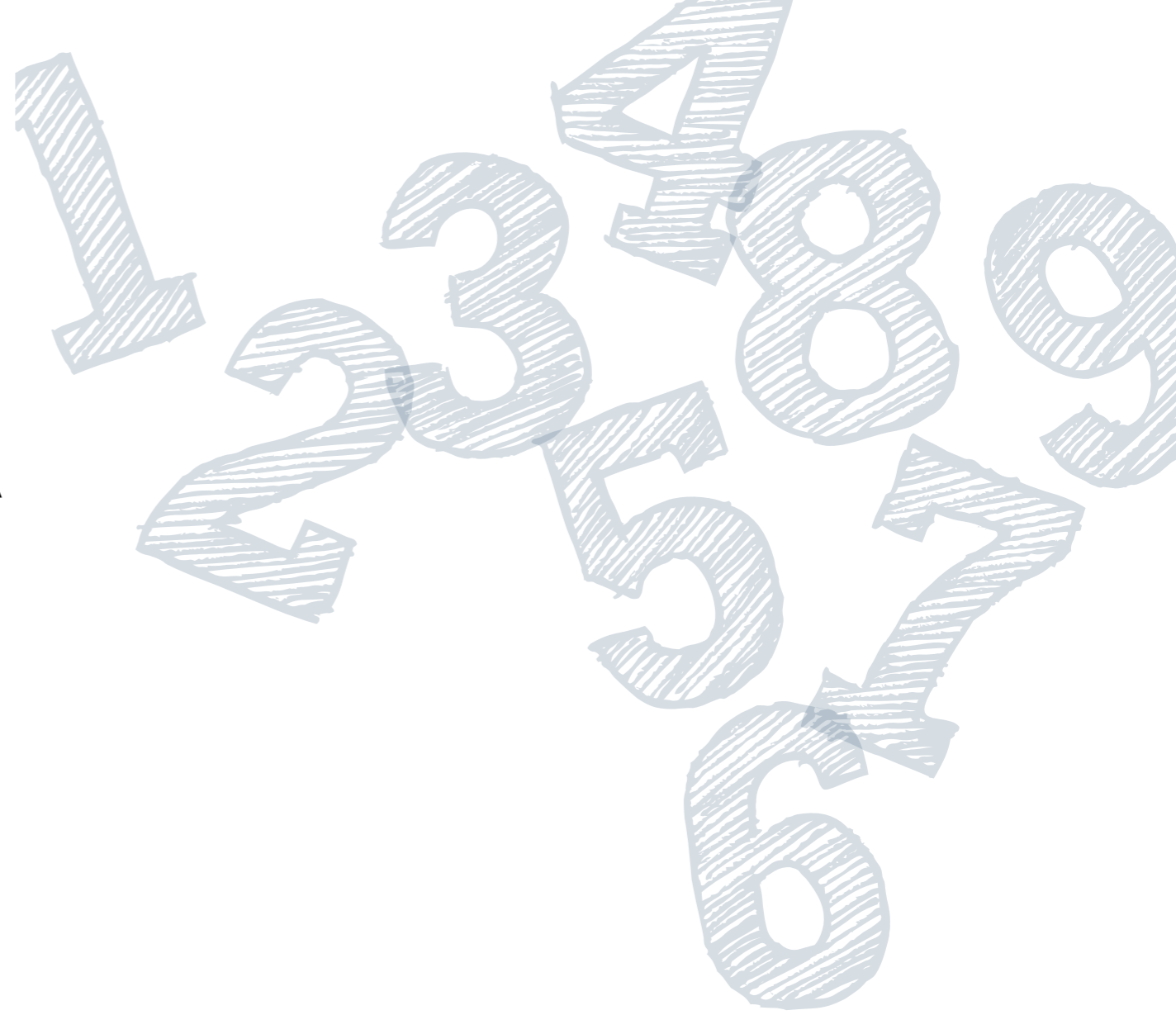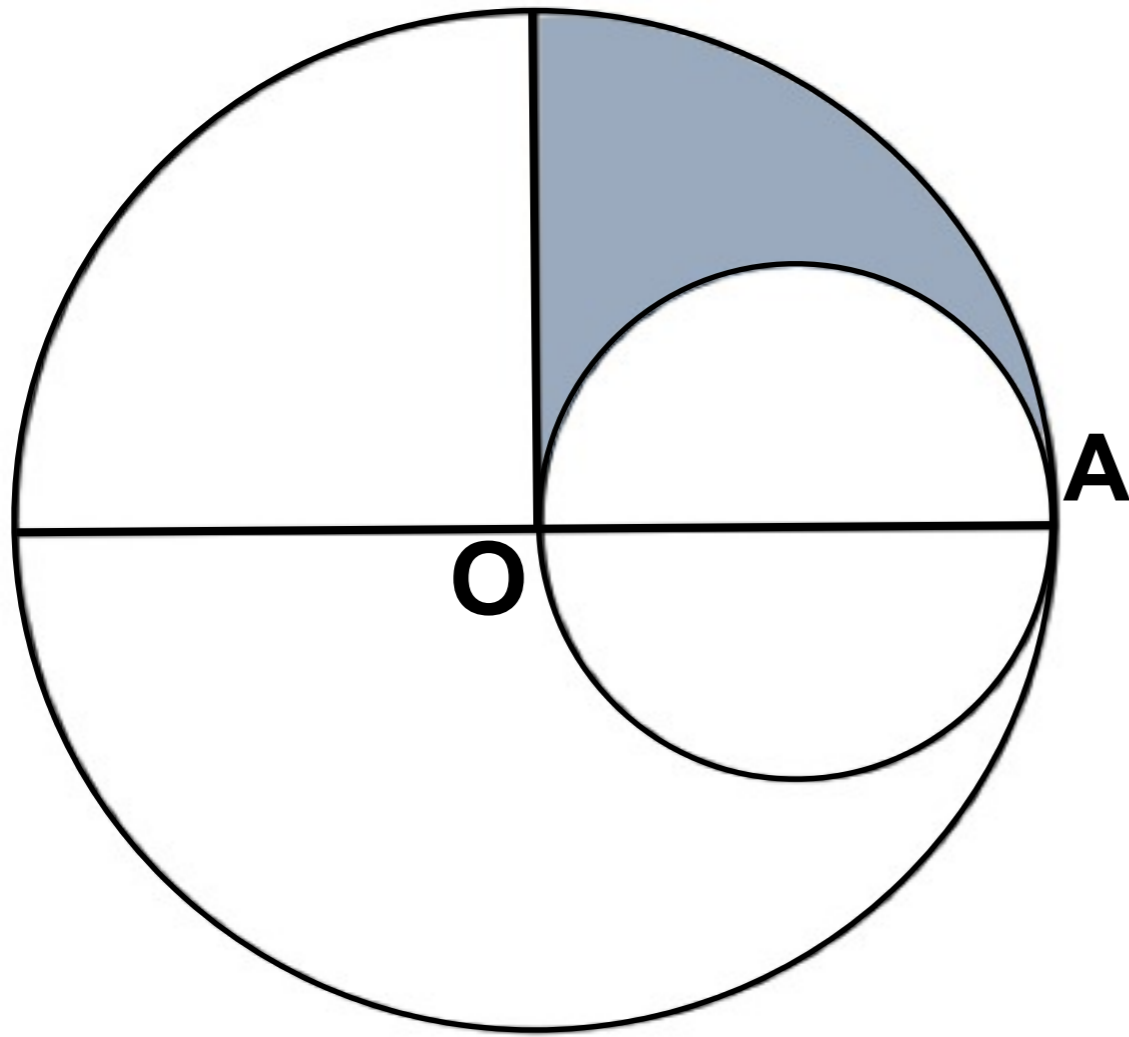
Area of 1/4 of the large circle

$A=\pi r^2$

$A=113.1$

$113.1 \div 4 = 28.275$

Area of 1/2 of the small circle

$A=\pi r^2$

$A=28.27$

$28.27 \div 2 = 14.135$

Area of the grey

$A=28.275-14.135$

$A=14.14$
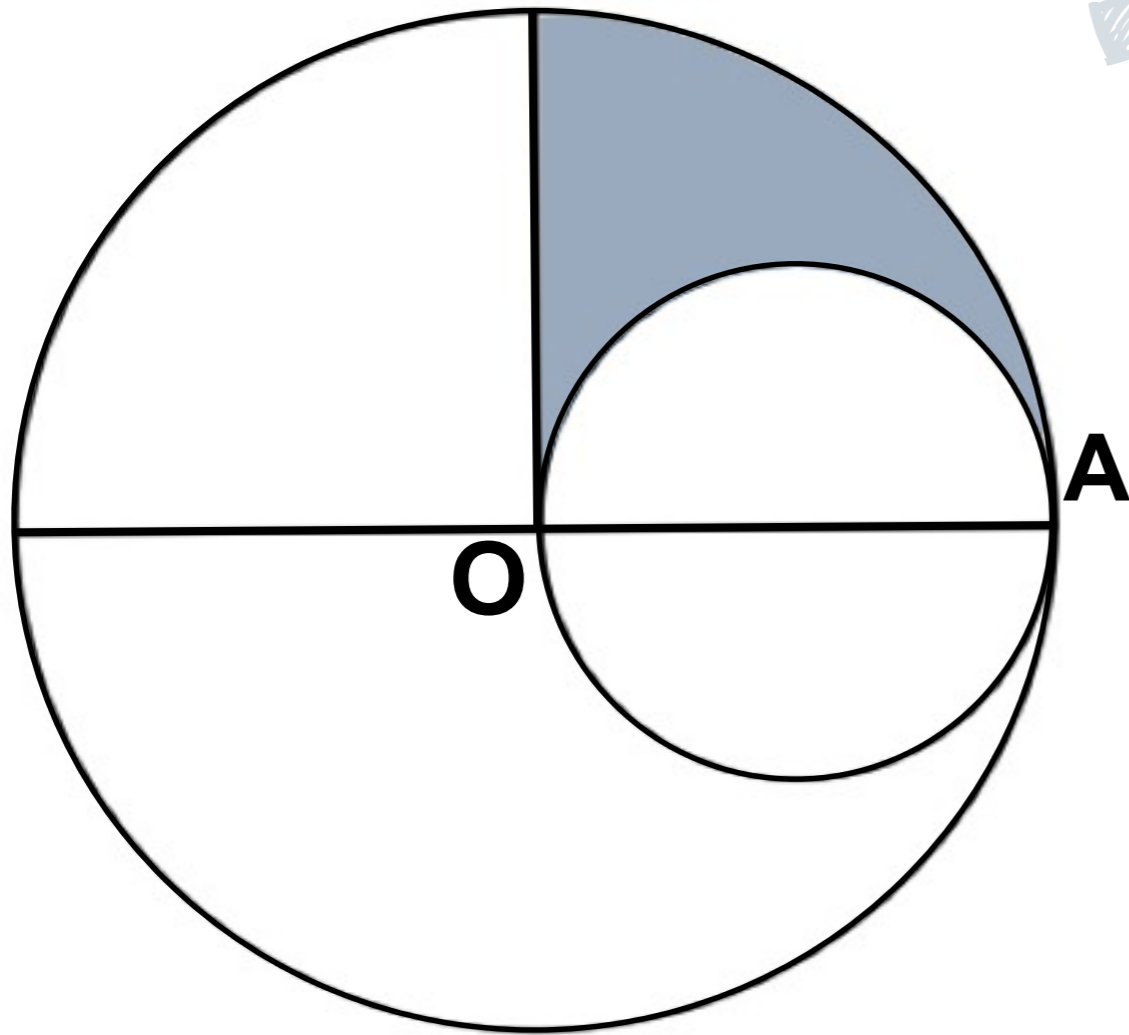
Are the same patterns there if we change the length of O to A?

Let's try 4 units...

Area of 1/4 of the large circle

$A=\pi r^2$

$A=50.27$

$50.27 \div 4 = 12.5675$

Area of 1/2 of the small circle

$A=\pi r^2$

$A=12.57$

$12.57 \div 2 = 6.285$

Area of the grey

$A=12.5675-6.285$

$A=6.2825$

WOULDN'T THEIR LEARNING BE RICH IF THEY WALKED AWAY FROM THIS PROBLEM THINKING "OF COURSE – BECAUSE AREA IS A SQUARE RELATIONSHIP"

THE EVOLUTION OF OUR PROGRAM

ONLINE DISCUSSION, THINKING & BLOGS

My Reading Blog

Making Inferences:Tex by S.E.Hinton

TEX

My book is called Tex. The book is about a kid whose name we don't know yet it could be tex but who knows. Growing up in a troubled environment, with no dad no mom and an abusive brother. Tex only loves two thing his brothers and friends motorcycle and his horse named negrito. The so called family is pressed for money and eventually his brother has to turn to drastic measures.

<u>Inferences</u>

1st. Inference. Brotherly love.
Well this book is hard to read theres allot of things boggling my
mind and didn't
although its fic
kind of insinua
really explain a
him and the bo

Riddles 15 January 2014 13:11

Great inferences for your first time! Your book sounds good from your summary, and I like how you did three infers, even though you're only required to do two. Awesome!

Reply

Amelia's Reading Blog

Blog Post #8: The Fault in Our Stars

So to catch everyone up on my reading throughout this week, I finished Paper Towns on Tuesday (which was absolutely exceptional) and then Thursday, Mlle Goodwin gave me what might possibly be one of my favourite books of all time, The Fault In Our Stars. This book is written by John Green in the point of view of 16 year old, Hazel Grace Lancaster. She has been suffering from thyroid cancer originally but with an impressive and long-settled satellite colony in her lungs since the age of 13. She dreads going to a support group that her mother believes helps her. Don't take that as Hazel having a bad relationship with her mother. It's pretty normal I would say but that's besides the point. It's at the support group in a church basement where she meets Augustus Waters. Gus is a 17 year old who suffered from osteosarcoma and had to have his right leg amputated. has been in remission (which means cancer free) for a while but attends the group more or less for his friend Isaac. The book continues to focus on the developing relationship between Hazel and Augustus and all of their adventures in between.

One inference I made was during the part of the novel when Gus pulls out a cigarette, doesn't light it and puts it in his mouth. He says Hazel "It's a metaphor, see: you put the killing thing right between

Looking For Other Posts?

3 comments:

TylerMc#DeepFriedChicken 10 February 2014 18:57
I like how your synopsis and inferences are really thorough and clear of what you're saying
Reply

Aislinn Voldemort 13 February 2014 14:04
Your summary was great! You put a lot of detail into your inferences, great job!
Reply

Connor_McBirdWatcha 14 February 2014 06:11
Great job! So much detail it was really interesting to read.
Reply

My ELA Reading Blog

Reading Response #10: American born Chinese

I am reading this book called American born Chinese. This book is about young Jin wang who wants to be an average american boy, but this is hard for him since he was born in China. At the same time in the story there are gods, monkeys and monks, fighting it out and discussing how to resolve these fights.
To make things worse Jin wang has also fallen for a girl, and is constantly being tortured by his asian cousin who makes school even harder for him then it already is.

INFERENCE 1- My first inference is about when Jin wang noticed that his crush seemed to like this other boy, he then thought about it and thought it was about his hair, the next day he went to school with the exact same haircut as this boy. What I am inferencing from this is that Jin feels that because he's from China she won't like him, so if he makes himself look more like an american boy, he has a chance with her. This makes me think of the time when I went to Punta Cana for a week and I had to adjust to this new place, I had to wear

HOW THIS INFERENCE HELPS ME BETTER UND

better understand the text, because it gives me a p
for him to have come from China and adapt to this

INFERENCE 2- This inference is when Jin wakes u
blond average american boy, and instead of freakin
from this is, that Jin is happy to not have to go thro
appearance, because somehow it's already done fo
it.

2 comments:

Tessa 14 February 2014 08:33

I really like the organization of this post, and it was good that it was so clear and easy to read. I also really liked how you included each step on Ms. Goodwin's list of "Making Inferences". Just watch out for a few punctuation errors. Great post! :)

Reply

Evan the Vampire Slayer 14 February 2014 08:35

Good job this week Jan:) Just remember to make an inference instead of a connection (1st inference) overall, great job! Keep it up!:)

Reply

Reading Response #10- The Fall of Five

The Fall of Five

Pittacus Lore

    This week I am indulging in a spectacular book of the award winning series, the I am Number Four series book 4, The Fall of Five. This book tells the epic war of Aliens, humans and situated on earth so what could go wrong! The good guys are called the Garde, the last ten Lorien people in the universe, luckily they are chosen to be the last because of their amazing powers called legacies.
The aliens fight and are joined by hum

My first inference about the book is ab
died which is a bit weird considering t
from book 2 to 3, just an observation.
Inference is about the title, right? Wel
author is implying that Number Five, w
think that this inference I could use fo
because the Garde does not meet nine
rised. I think that this inference will h
preparing myself for the death of at le

My next inference is about Eight and S
friends with more benefits, and are sp
other. My inference about them is agai
books have a bit of romance and then
inference about one of them dying, I t
way to end the book and with a giant v
can connect to this inference by relati
death can be used to make suspense an
me with writing strategies and in ELA

4 comments:

Elijahlovesbacon 17 January 2014 07:06
i loved your blog this week it was really descriptive
Reply

Justin's Moustache 17 January 2014 07:24
Good detail, I liked that you put in a photo, and I don't think I ever saw the movie!
Reply

Tristan_Is_Boss 19 January 2014 07:51
Your blog was really descriptive, but you had some spelling errors.
Reply

vanessatheultimatefigureskater 1 February 2014 16:06
It's not like there are any spoilers at all.....(sarcasm on) But other than that, it was really good! I'm glad you like that book, it's one of my all time favorite books, but then again I have a lot of favorite books. (I just totally confused myself)
Reply

ROLLING
THIS
SUCCESS
INTO MATH

DAN MEYER

worker, learner, speaker, go-getter

EMAIL dan@mrmeyer.com
TWITTER ddmeyer
BLOG dy/dan

WORKER

2010/14	Digital Mathematics Curriculum Consultant
2009/10	Curriculum Fellow Google
2006/10	Secondary Math Teacher San Lorenzo Valley USD
2004/05	Secondary Math Teacher Elk Grove USD

LEARNER

|	
2010/14	Ph.D. Candidate, Education Stanford University
2005	M.A., Education UC Davis
2004	Clear Single Subject Credential, Mathematics UC Davis
2003	B.S., Mathematics UC Davis

GO-GETTER

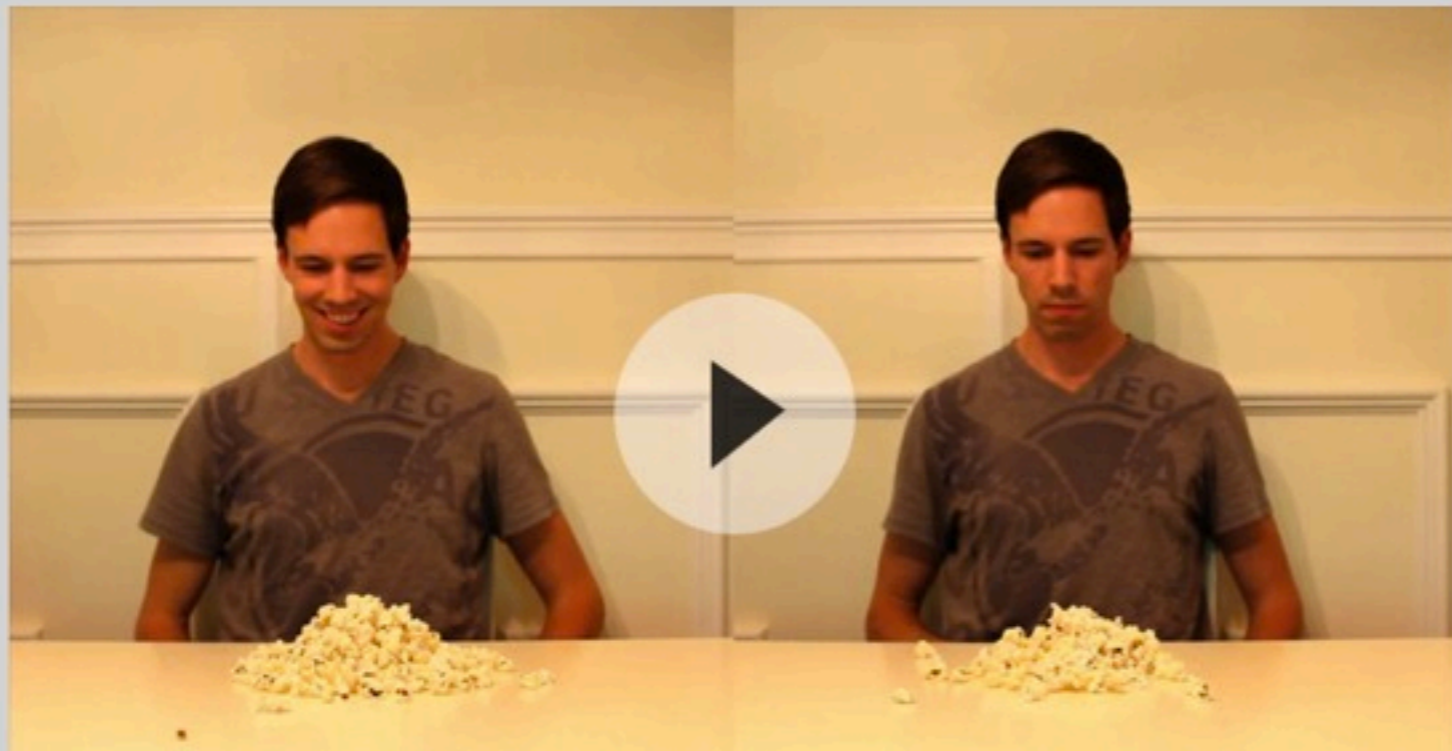|	
2014	DRK-12 Grant Review Panelist NSF
2011	Apple Distinguished Educator
2010	Thirty Leaders of the Future Tech & Learning
2008	Leader in Learning Cable in the Classroom
2007	Best New Blog Edublogs
2005	te@ch Grant Best Buy
2004	Guinness World Record

SPEAKER

act one
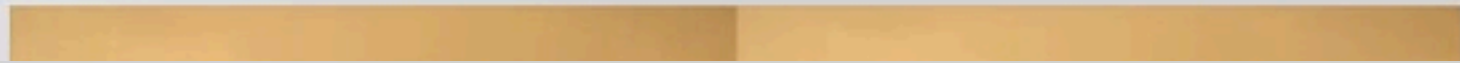
act two

3. What information would be useful to know here?

image — dimensions of the papers

act three

Welcome to a whole lot of lockers...

Watch this:

POW Lockers

0:00 / 2:11

Thinking about what you
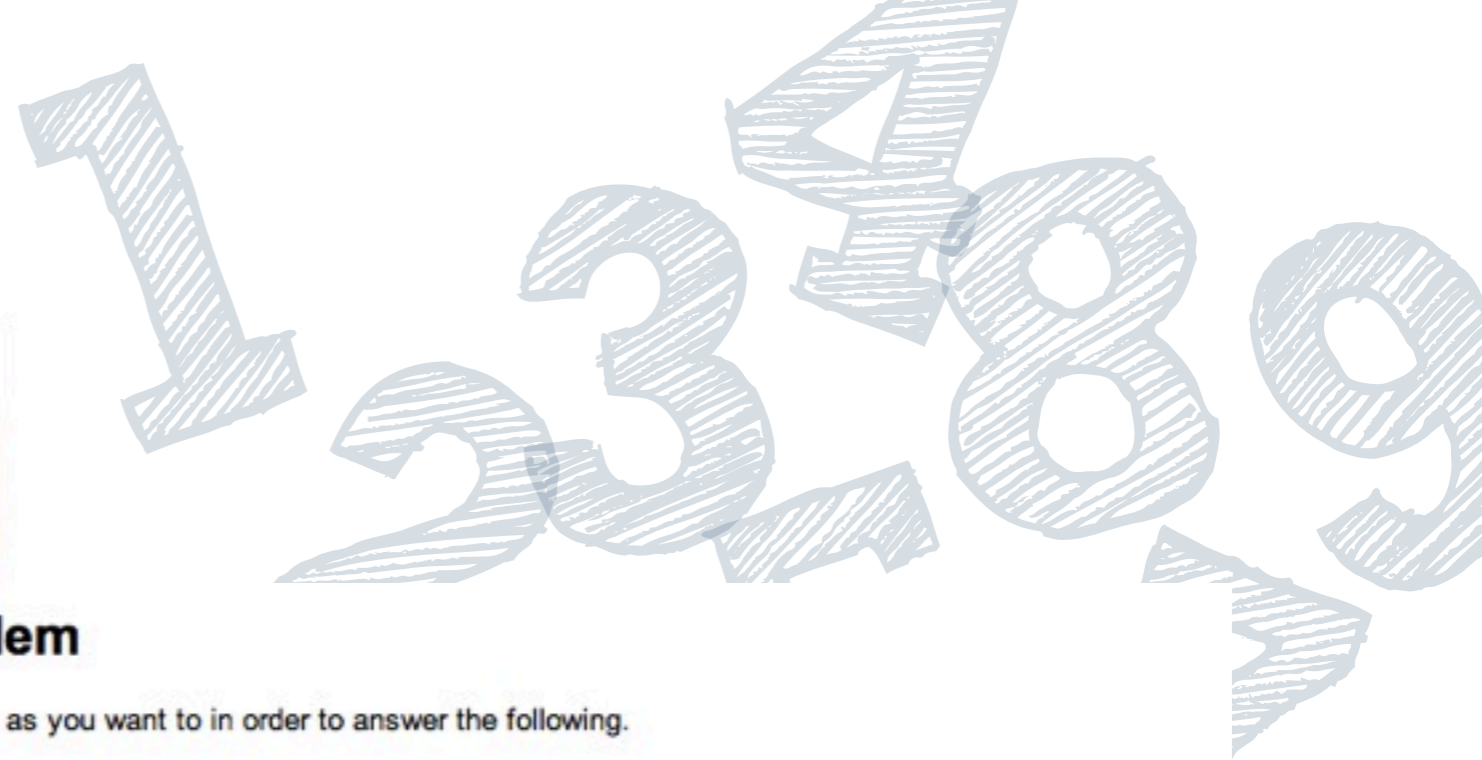
The Locker Problem

Watch the video as many times as you want to in order to answer the following.

* Required

What is your FIRST NAME? *

What is your LAST NAME? *

Which class are you in? *

What question do you think that you are investigating?

Why information do you already know?
Make a list in the paragraph box below.

THE EVIDENCE

EXAMINING STUDENT RESPONSES

SEPTEMBER

Bucky the Badger (Dan Meyer)

BUCKY THE BADGER ESTIMATE: 576

I think this answer sounds reasonable (for this problem) because this pattern adds 7 or 3 every time while doing the total number of points. That'll add up to a big number when you keep going to 83

BUCKY THE BADGER ESTIMATE: 169

It doesn't

BUCKY THE BADGER ESTIMATE: 170

I think this answer sounds reasonable because each point the team gets he does that many more push-ups. If he did 200 that would be too many because it just seems like too many, but because the score ended at 83, 100 push-ups would be too few.

BUCKY THE BADGER

ABSENT

SPENCER

BUCKY THE BADGER

ABSENT

BUCKY THE BADGER ESTIMATE: 450

Because I know that every time they score a field goal or a touchdown Bucky does about 20+ pushups so adding that all together to get to 83 I think that he would have to do a lot of push ups

VANESSA

OCTOBER

The Locker Problem

The question being investigated is...

After all this opening and closing of the lockers, how many of the 1000 lockers are open?

AMELIA
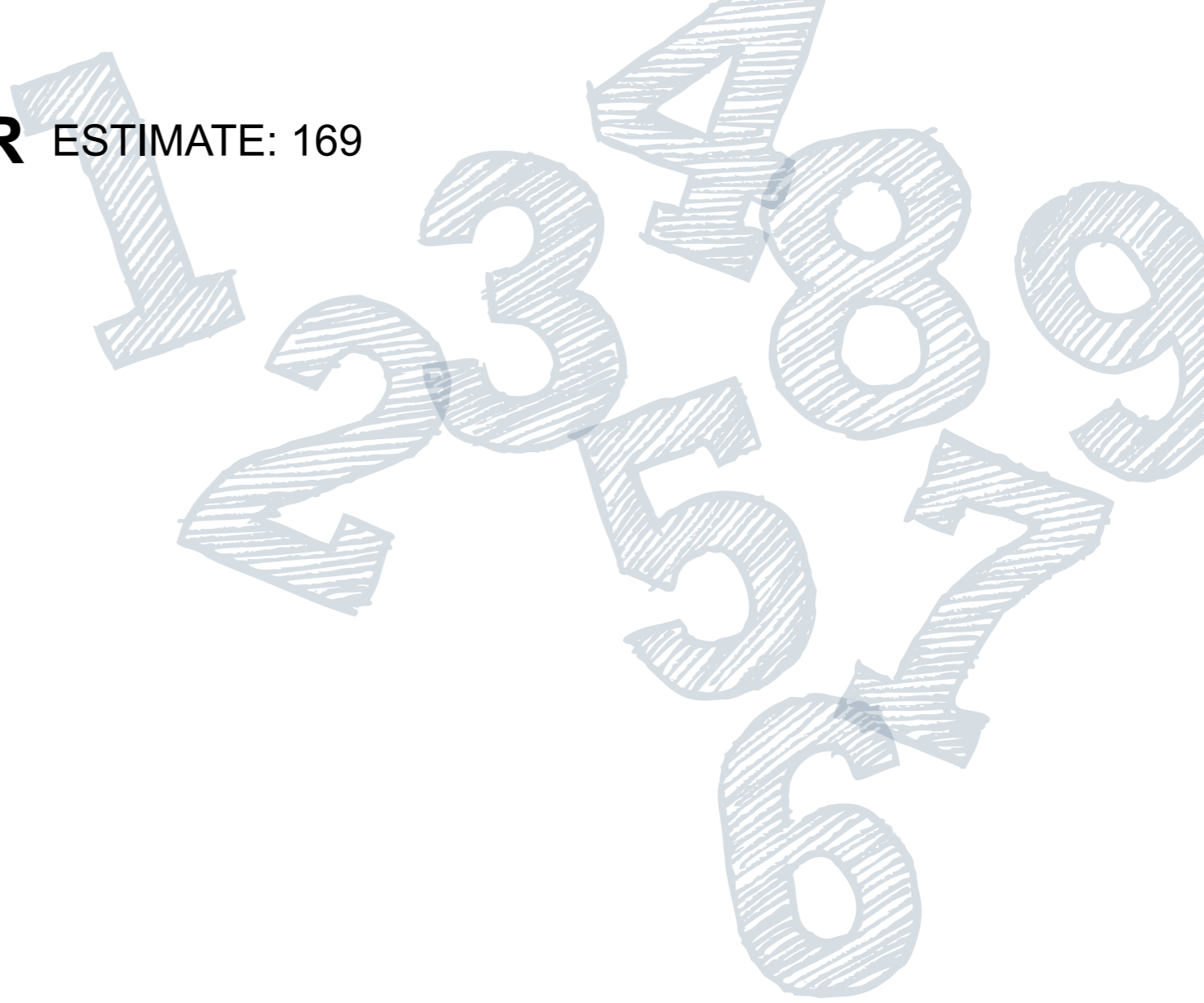
BUCKY THE BADGER ESTIMATE: 576

I think this answer sounds reasonable (for this problem) because this pattern adds 7 or 3 every time while doing the total number of points. That'll add up to a big number when you keep going to 83.

THE LOCKER PROBLEM ESTIMATE: 39

I'm using my knowledge of last years problem, a flotilla of factors (I think that's what it was called...). Anyways, The pattern I found last year was each number to the power of 2. The pattern ended at 31 to the power of 2 because 32 to the power of 2 was 1024. 31x31+961.

BRINLAE

It doesn't

THE LOCKER PROBLEM ESTIMATE: 660

Because it is a multiple of 2 and 3 and is between 500 and 700

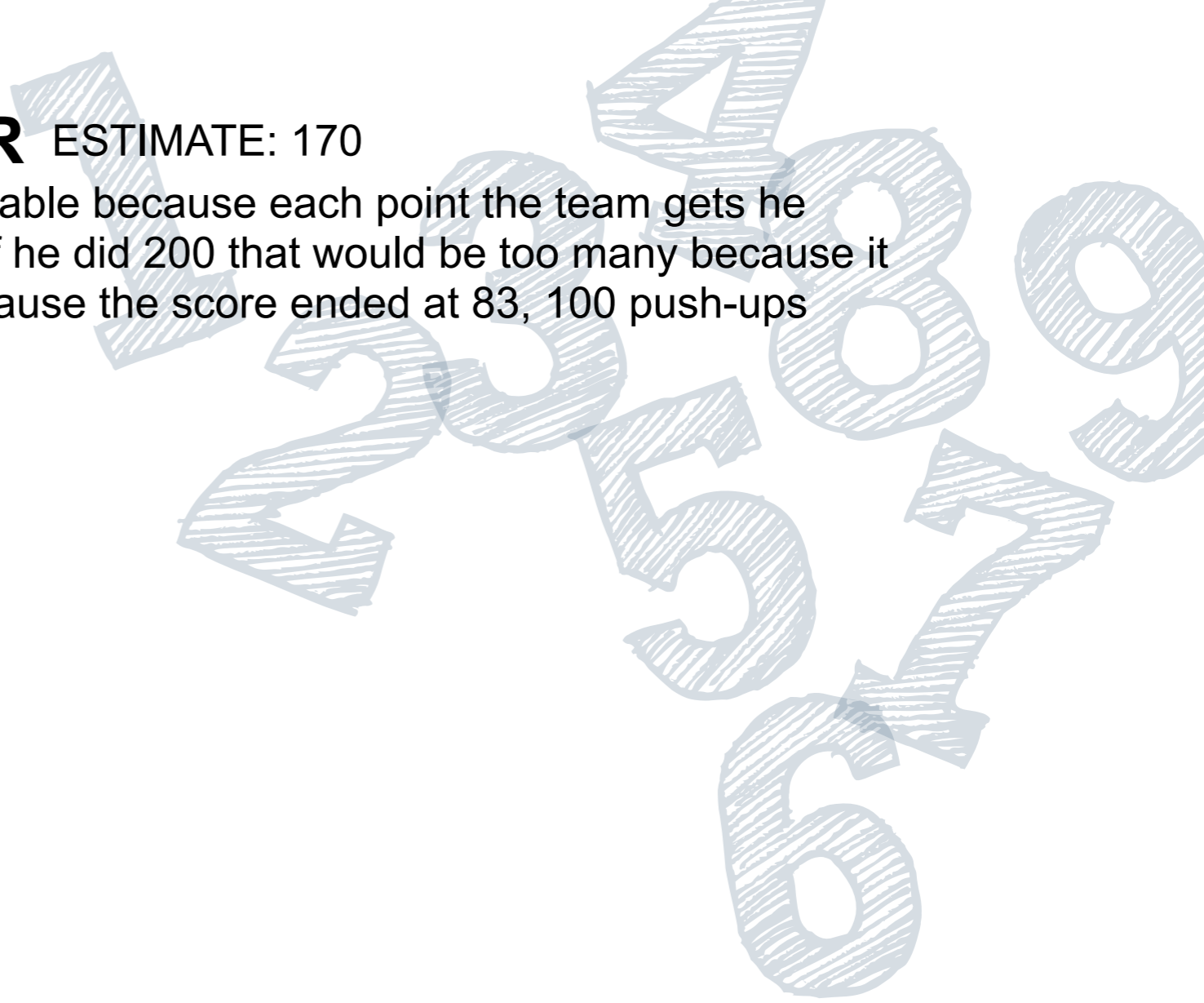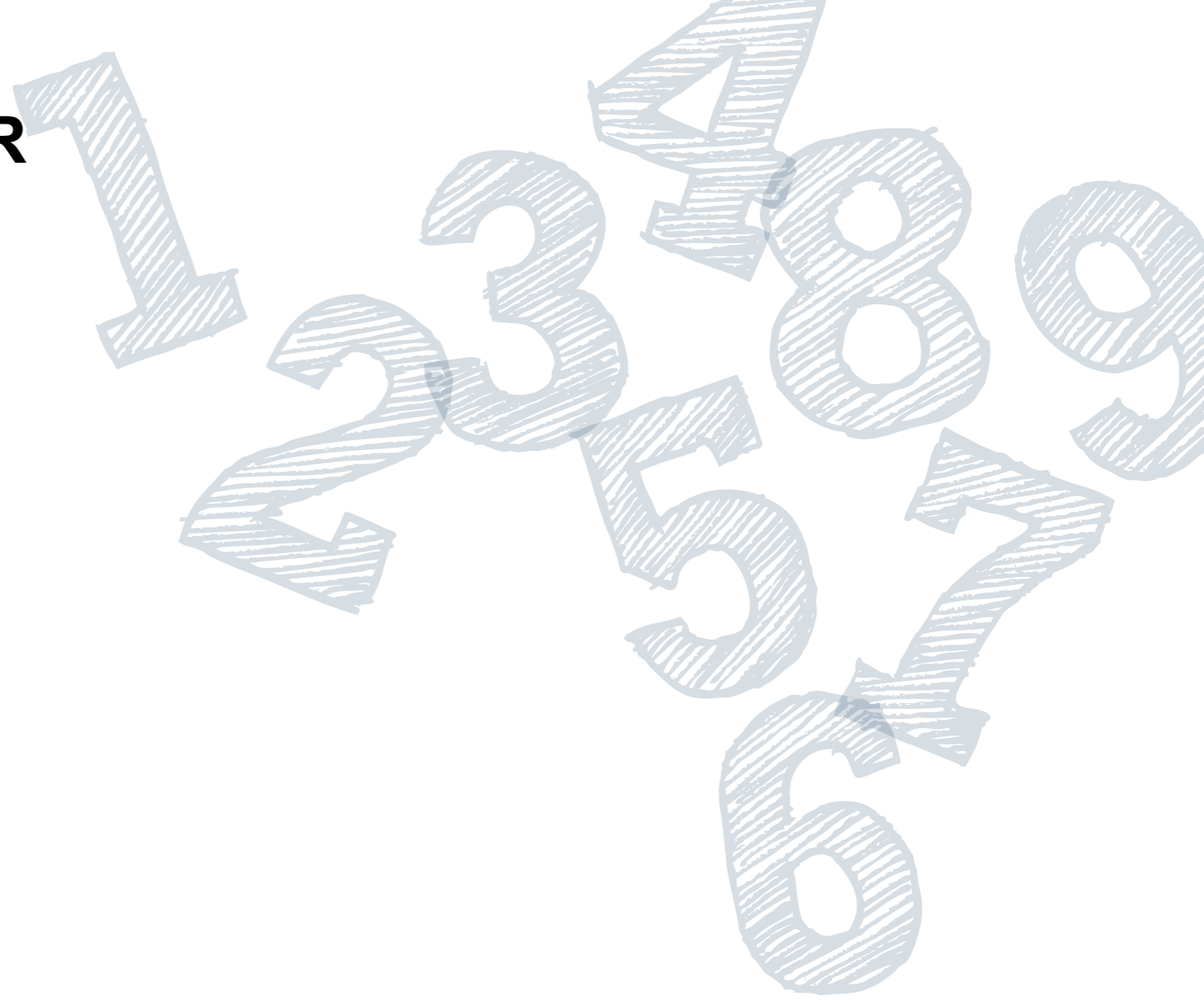## BUCKY THE BADGER ESTIMATE: 170

I think this answer sounds reasonable because each point the team gets he does that many more push-ups. If he did 200 that would be too many because it just seems like too many, but because the score ended at 83, 100 push-ups would be too few.
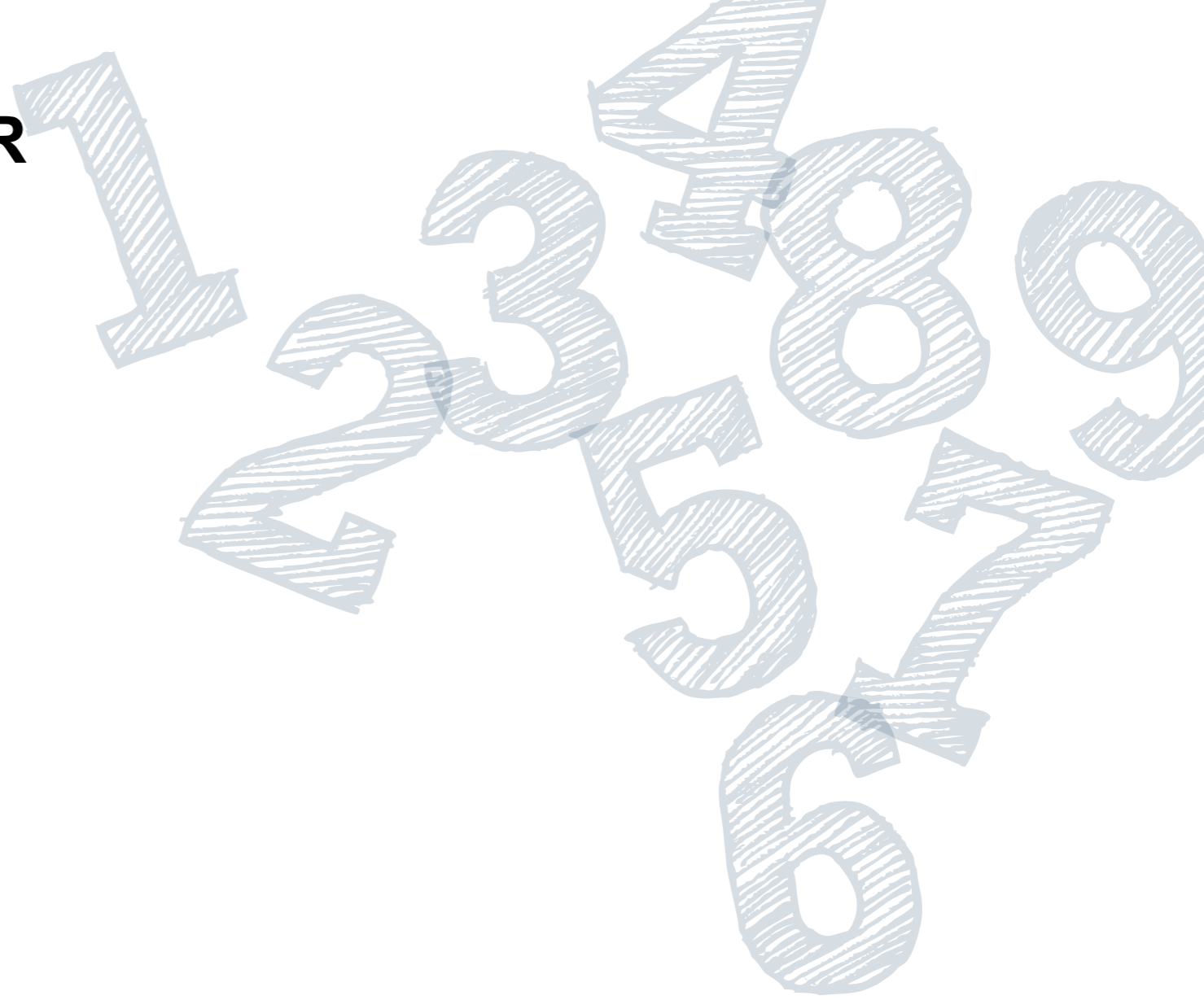
THE LOCKER PROBLEM ESTIMATE: 75

I think 75 is a reasonable amount of lockers open because every

THE LOCKER PROBLEM ESTIMATE: 30

Because so far the open lockers are all perfect squares, and I know from 24 that the square of 24 is 576, so it can't be much higher than that or else it'll go over 1000.

THE LOCKER PROBLEM ESTIMATE: 31

Because if you find the difference between each square number it increases each time by two.
1,4,9,16,25 so the differences are 3,5,7,9, and if you continue it would be a lot. And maybe we did this last year. If you keep adding so 1, 13, 15 it will end before 1000. The one closest to 1000 you have to square root it then you will get 31 I think that is what remember from last year.

VANESSA

BUCKY THE BADGER ESTIMATE: 450

Because I know that every time they score a field goal or a touchdown Bucky does about 20+ pushups so adding that all together to get to 83 I think that he would have to do a lot of push ups

THE LOCKER PROBLEM ESTIMATE: 250

Because I think that there won't be tons of lockers open because as the numbers get larger more lockers will close, so I think that 250 is like a quarter of 1 000 so I think it is a reasonable number of lockers to have open.

DECEMBER

New Students

The question being investigated is...

How many ways can these students be assigned to the empty seats?

AMELIA

BUCKY THE BADGER ESTIMATE: 576

I think this answer sounds reasonable (for this problem) because this pattern adds 7 or 3 every time while doing the total number of points. That'll add up to a big number when you keep going to 83.

THE LOCKER PROBLEM ESTIMATE: 39

I'm using my knowledge of last years problem, a flotilla of factors (I think that's what it was called...). Anyways, The pattern I found last year was each number to the power of 2. The pattern ended at 31 to the power of 2 because 32 to the power of 2 was 1024. 31x31+961.

NEW STUDENTS ESTIMATE: 10 or 20

I chose 10 because there is 10 combinations without repeat combinations in a different order (such as A,B then not using B, A). There's 10 combinations if you do it that way. But 20 is also reasonable if you think about the problem a different way. There would be 20 possibilities if you thought of it like this:
Student #1 sits in A and student #2 sits in B- One combination of A,B
Student #1 sits in B and student #2 sits in A-Another combination of B,A
It depends on how you think about the problem and so far they're both correct because there has been no clarification about whether or not you can uses desks twice.

BRINLAE

BUCKY THE BADGER   ESTIMATE: 169

It doesn't

THE LOCKER PROBLEM   ESTIMATE: 660

Because it is a multiple of 2 and 3 and is between 500 and 700

NEW STUDENTS

ABSENT

MCKENNA

BUCKY THE BADGER ESTIMATE: 170

I think this answer sounds reasonable because each point the team gets he does that many more push-ups. If he did 200 that would be too many because it just seems like too many, but because the score ended at 83, 100 push-ups would be too few.

THE LOCKER PROBLEM ESTIMATE: 75

I think 75 is a reasonable amount of lockers open because every

NEW STUDENTS ESTIMATE: 50

This answer does sound reasonable to me because For each desk there are 10 possible seating arrangements, and there are 5 desks. Therefore the answer of 50 different combinations sounds reasonable to me.

BUCKY THE BADGER

ABSENT

THE LOCKER PROBLEM ESTIMATE: 30

Because so far the open lockers are all perfect squares, and I know from 24 that the square of 24 is 576, so it can't be much higher than that or else it'll go over 1000.

NEW STUDENTS ESTIMATE: 15

Well, the other student can't pick the seat the first one chose, so they would have to choose one of the other four. Then when the first person chose a different seat, the other person would have to choose one of the other four, but one of the choices wouldn't count because it would be the same seat the first student sat in before, so that turn there would really only be three choices. I know 1+2+3+4+5=15, so that's what I'm going with.

SPENCER

BUCKY THE BADGER

ABSENT

THE LOCKER PROBLEM ESTIMATE: 31

Because if you find the difference between each square number it increases each time by two.
1,4,9,16,25 so the differences are 3,5,7,9, and if you continue it would be a lot. And maybe we did this last year. If you keep adding so 1, 13, 15 it will end before 1000. the one closest to 1000 you have to square root it then you will get 31 I think that is what remember from last year.

NEW STUDENTS ESTIMATE: Either 2 to the power of 5 or 5 to the power of 2. So 25 or 32.

Because When I see people play the trumpet there are three valves and there are 9 finger combos. 1, 12, 13, 23, 123, 0, 01, 02, 03. So 3 valves, to the power of 2. Or maybe its three valves times 3 fingers. That way the answer to the big question would be ten because 5 x the number of switchable things = 10. So I will keep with the rule of seats to the power of 2.

VANESSA

BUCKY THE BADGER ESTIMATE: 450

Because I know that every time they score a field goal or a touchdown Bucky does about 20+ pushups so adding that all together to get to 83 I think that he would have to do a lot of push ups

THE LOCKER PROBLEM ESTIMATE: 250

Because I think that there won't be tons of lockers open because as the numbers get larger more lockers will close, so I think that 250 is like a quarter of 1 000 so I think it is a reasonable number of lockers to have open.

NEW STUDENTS ESTIMATE: 10

Because there are at leas 5 possible combinations, so if I label the desks from 1-5 then i can explain this. i am going to label the people n1 and n2 for new 1 and 2, and i am going to label something,like n1-5 meaning new student 1 at desk 5... n1-1 n2-2, n1-2 n2-3, n1-3 n2-4, n1-4 n2-5, n1-5, n2-1, n1-1 n2-3, n1-2 n2-5, n1-2 n2-4, n1-4, n2-1. There are probably more than that but that is all I could come up with and that is why my prediction is 10 combinations.

MARCH

Basketball

The question being investigated is...

Based on his statistics from the 2013 - 2014 season, do you expect Chadrack to make this free throw?

AMELIA

BUCKY THE BADGER   ESTIMATE: 576

I think this answer sounds reasonable (for this problem) because this pattern adds 7 or 3 every time while doing the total number of points. That'll add up to a big number when you keep going to 83.

THE LOCKER PROBLEM   ESTIMATE: 39

I'm using my knowledge of last years problem, a flotilla of factors (I think that's what it was called...). Anyways, The pattern I found last year was each number to the power of 2. The pattern ended at 31 to the power of 2 because 32 to the power of 2 was 1024. 31x31+961.

NEW STUDENTS   ESTIMATE: 10 or 20

I chose 10 because there is 10 combinations without repeat combinations in a different order (such as A,B then not using B, A). There's 10 combinations if you do it that way. But 20 is also reasonable if you think about the problem a different way. There would be 20 possibilities if you thought of it like this:
Student #1 sits in A and student #2 sits in B- One combination of A,B
Student #1 sits in B and student #2 sits in A-Another combination of B,A
It depends on how you think about the problem and so far they're both correct because there has been no clarification about whether or not you can uses desks twice.

BASKETBALL   ESTIMATE: 5/8

Well I added up the amount of attempts (86) and the amount of shots made (51) so as a fraction it was 51/86. And I'm still working on dividing the fractions to a more precise fraction but for a prediction the 5/8 seems reasonable to me.

BRINLAE

BUCKY THE BADGER ESTIMATE: 169

It doesn't

THE LOCKER PROBLEM ESTIMATE: 660

Because it is a multiple of 2 and 3 and is between 500 and 700

NEW STUDENTS

ABSENT

BASKETBALL ESTIMATE: He will

He has more than a 50% chance of making the shot based on his statistics
Also he has multiple times made 4-4 or 2-2 in one game

MCKENNA

BUCKY THE BADGER ESTIMATE: 170

I think this answer sounds reasonable because each point the team gets he does that many more push-ups. If he did 200 that would be too many because it just seems like too many, but because the score ended at 83, 100 push-ups would be too few.

THE LOCKER PROBLEM ESTIMATE: 75

I think 75 is a reasonable amount of lockers open because every

NEW STUDENTS ESTIMATE: 50

This answer does sound reasonable to me because For each desk there are 10 possible seating arrangements, and there are 5 desks. Therefore the answer of 50 different combinations sounds reasonable to me.

BASKETBALL ESTIMATE: Based on his stats I predict that he will make the shot

This sounds reasonable to me because he has over 50% percent that he will make the shot because the last 13 shots he took, 9 went in.
9/13 = 0.692307692
0.692307692 x 100 = 69.2%
So he has a 69.2% of making the shot (almost 70% chance)

RIDLEY

BUCKY THE BADGER

ABSENT

THE LOCKER PROBLEM ESTIMATE: 30

Because so far the open lockers are all perfect squares, and I know from 24 that the square of 24 is 576, so it can't be much higher than that or else it'll go over 1000.

NEW STUDENTS ESTIMATE: 15

Well, the other student can't pick the seat the first one chose, so they would have to choose one of the other four. Then when the first person chose a different seat, the other person would have to choose one of the other four, but one of the choices wouldn't count because it would be the same seat the first student sat in before, so that turn there would really only be three choices. I know 1+2+3+4+5=15, so that's what I'm going with.

BASKETBALL ESTIMATE: I predict he will

Because 9/ 13 is almost 9/12 which is equivalent to 3/4, so there is a fairly good chance.

SPENCER

BUCKY THE BADGER

ABSENT

THE LOCKER PROBLEM ESTIMATE: 31

Because if you find the difference between each square number it increases each time by two.
1,4,9,16,25 so the differences are 3,5,7,9, and if you continue it would be a lot. And maybe we did this last year. If you keep adding so 1, 13, 15 it will end before 1000. the one closest to 1000 you have to square root it then you will get 31 I think that is what remember from last year.

NEW STUDENTS ESTIMATE: Either 2 to the power of 5 or 5 to the power of 2. So 25 or 32.

Because When I see people play the trumpet there are three valves and there are 9 finger combos. 1, 12, 13, 23, 123, 0, 01, 02, 03. So 3 valves, to the power of 2. Or maybe its three valves times 3 fingers. That way the answer to the big question would be ten because 5 x the number of switchable things = 10. So I will keep with the rule of seats to the power of 2.

BASKETBALL ESTIMATE: 2/3

Because 26/35 and 9/13 are both near the fraction 2/3
So if you add all the stats and not just the samples you gave us, then I think the fraction will be near 2/3 too.

VANESSA

BUCKY THE BADGER   ESTIMATE: 450

Because I know that every time they score a field goal or a touchdown Bucky does about 20+ pushups so adding that all together to get to 83 I think that he would have to do a lot of push ups

THE LOCKER PROBLEM   ESTIMATE: 250

Because I think that there won't be tons of lockers open because as the numbers get larger more lockers will close, so I think that 250 is like a quarter of 1 000 so I think it is a reasonable number of lockers to have open.

NEW STUDENTS   ESTIMATE: 10

Because there are at leas 5 possible combinations, so if I label the desks from 1-5 then i can explain this. i am going to label the people n1 and n2 for new 1 and 2, and i am going to label something,like n1-5 meaning new student 1 at desk 5... n1-1 n2-2, n1-2 n2-3, n1-3 n2-4, n1-4 n2-5, n1-5, n2-1, n1-1 n2-3, n1-2 n2-5, n1-2 n2-4, n1-4, n2-1. There are probably more than that but that is all I could come up with and that is why my prediction is 10 combinations.

BASKETBALL   ESTIMATE: I think that he will make the shot

I think he will make this shot because his statistics show that more than half of the time he makes his free throws, he more consistently makes his shots than he misses them. 9/13 that is quite a bit more than half because half of 13 is 6.5 and 9/13 is 2.5 over half so he has a little bit of accuracy going for him, I think.