

See You on the FLIP Side

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What is a 'Flipped' Classroom?

- * A student-centered approach to teaching that involves the use of technology to create active learners who take ownership of their own education.

Flipping is NOT:

- * An online course
- * Sitting in a computer lab
- * Lack of structure

Flipping is:

- * Increased focus on concepts and application
- * Personalized learning
- * Engaged learning
- * Increased student-teacher interaction
- * Increased collaboration

TRADITIONAL

“Sage on the stage”

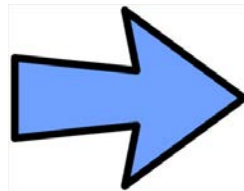
TRADITIONAL



SCHOOL

Teacher lectures content

TRADITIONAL



HOME

Student applies lesson

FLIPPED

“Guide by the side”

FLIPPED



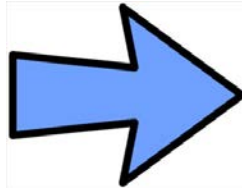
HOME

Student reviews content

FLIPPED

Teacher
facilitates
deeper
discussion

SCHOOL



THE GOAL

- * Lower level cognitive work done outside of class (e.g. terminology, gathering information, etc.)
- * Higher level cognitive work done inside class (e.g. application, analysis, etc.)

FLASHBACK

Is Flipping really a new idea??

- * Do literature classes read novels only during class?
- * Read the book and take notes
- * Try the homework
- * Come prepared to discuss in class

WHAT'S NEW??

TECHNOLOGY!!!

- * Software
- * Internet
- * Videos/Podcasts
- * You Tube
- * Apps

WHAT'S NEW??

- * Technology allows us to address multiple learning styles more easily
- * Technology allows greater access to information and resources

FLIPPING MYTHS

1. You have to flip every lesson

- * Start small and build
- * Learn what works for your students



FLIPPING MYTHS

2. Flipping devalues teachers

- * Dispensing information is easy – understanding concepts is hard
- * Students need help becoming independent learners



FLIPPING MYTHS

3. Flipping will fix U.S. math

- * Students are unprepared
- * Careful planning necessary
- * Hard to reach students may still be hard to reach



FLIPPING MYTHS

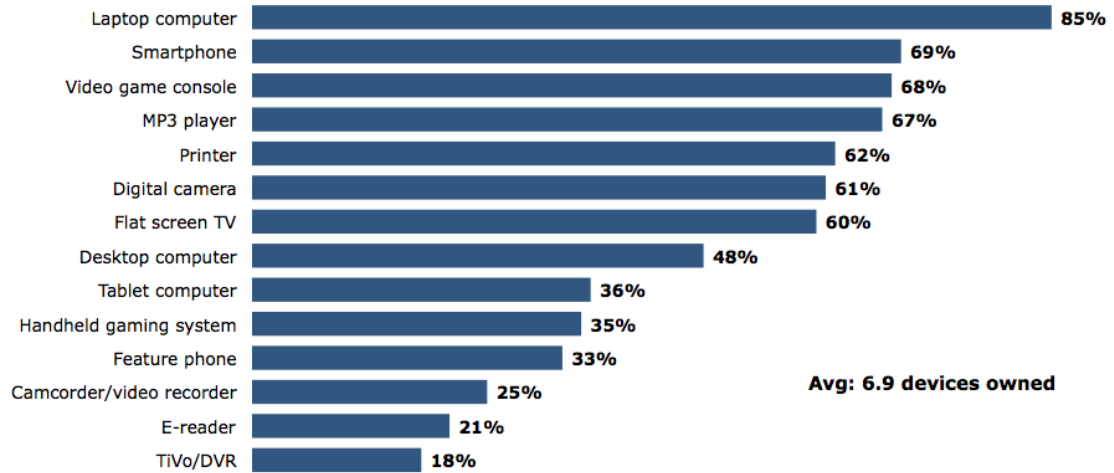
4. Flipping only works with internet access

- * School labs
- * Smartphones
- * DVDs



Tech Devices Owned by College Students

%
June 2013



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FLIPPING MYTHS

5. Flipping means online videos

- * Quality not quantity
- * Interactive
- * Guided study



THINGS TO CONSIDER WHEN IMPLEMENTING A FLIP

- * Be clear with expectations
- * Not everything needs to be flipped
- * Emphasize individual work at home and group work in class

THINGS TO CONSIDER WHEN IMPLEMENTING A FLIP

- * Focus on quality not quantity
- * Team up with others to share the work
- * Too much of anything is usually bad
– mix it up!

THINGS TO CONSIDER WHEN IMPLEMENTING A FLIP

- * Hold students accountable for outside work
- * Assess outside work to help focus direction of in-class work

THINGS TO CONSIDER WHEN IMPLEMENTING A FLIP

- * Stick to simple (inexpensive) established technologies
- * Publisher content (but be picky)
- * ADA Compliance

Example Activities

Exploring Sampling Distributions

- * Students record commute times to school and treat data as a population.
- * Repeated samples are taken and sample statistics are recorded.
- * The mean and standard deviation of the statistics are compared to population values.
- * Repeat with larger sample sizes.

Sampling Distributions

1.→ In the table below, to the nearest minute, record each group members commute time to campus. If you do not know your exact commute time, estimate it as accurately as you can.

| | | | | | | | |
|--------------|--|--|--|--|--|--|--|
| Student Name | | | | | | | |
| Commute Time | | | | | | | |

2.→ Treating the data above as a population, calculate the following parameters:

$$N = \underline{\hspace{2cm}} \quad \mu = \underline{\hspace{2cm}} \quad \sigma = \underline{\hspace{2cm}}$$

3.→ If samples of size $n = 2$ are taken from a population of size N , then there are ${}_N C_2$ possible samples. How many samples of size $n = 2$ are possible from the above population?

4.→ Use the first two columns of the table below to list all of the possible samples of size $n = 2$. Then, in the third column, compute the sample mean, \bar{x} , for each sample. Note: Depending on the size of your population, you may not use all of the rows provided below.

| | | | | | | | | |
|---|---------------|-----------------------|-----------------------|-----------|---------------|-----------------------|-----------------------|-----------|
| + | Sample Number | 1 st Value | 2 nd Value | \bar{x} | Sample Number | 1 st Value | 2 nd Value | \bar{x} |
|---|---------------|-----------------------|-----------------------|-----------|---------------|-----------------------|-----------------------|-----------|

Example Activities

Exploring Regression Modeling

- * Students use rubber bands as a bungee cord for Barbie.
- * Bungee distances are recorded for different number of rubber bands.
- * Students use collected data to predict the number of bands needed for a two-story bungee.
- * Follow-up discussion on variability, extrapolation, and other related concepts.

Barbie Bungee

With her perfect skin, perfect hair, unrealistically perfect waistline, extensive plastic surgery, and huge royalties from Mattel (check out that Malibu dream house), Barbie seems to have it all. She has mastered every profession from airline pilot to zookeeper and has now turned to thrill-seeking to give her life meaning.

You have been contracted to construct a bungee jump for Barbie. You need to construct the jump so Barbie will come within 10 centimeters of hitting the ground (so it is thrilling) but must ensure that she does not hit the ground at all (imagine the lawsuits, particularly from Mattel for loss of revenue). Safety first! However, if the ride is not thrilling enough, Barbie will sue you for breach of contract and take everything you own (including your pet hermit crab).

You decide to run some preliminary tests to help with design construction. You attach an anchor to a simulated Barbie and attach a piece of bungee rope (i.e. one rubber band) to the anchor. Dropping the simulated Barbie, you make note of the farthest distance she fell. [NOTE: this is **not** the final resting distance; we are talking about the farthest point reached *before* coming to rest.] You repeat the process several times, each time making the bungee rope longer. [NOTE: rubber bands should be connected using a slip knot.]

Complete the following table to summarize data you will use to construct the bungee jump.

| Number of Rubber Bands, x | Distance Fell (cm), y |
|-----------------------------|-------------------------|
| → → | |
| | |
| | |

Example Activities

Exploring Probability

- * Students record candy data.
- * Various probabilities are estimated.
- * Data for the class is combined and probabilities are estimated using class data.
- * Students contact the manufacturer to get actual distribution.
- * Actual probabilities are computed and compared to individual and class estimates.

Taste the (probability) Rainbow!!!

Each student should receive 1 fun-size Skittles and two 2-packs of Starbursts.

Starburst has 4 flavors: orange, lemon, strawberry, cherry

Skittles has 5 flavors: grape, apple, lemon, orange, strawberry

1. Count the number of each flavor of Skittles from your bag.

| Flavor | Grape | Apple | Lemon | Orange | Strawberry |
|--------|-------|-------|-------|--------|------------|
| Count | | | | | |

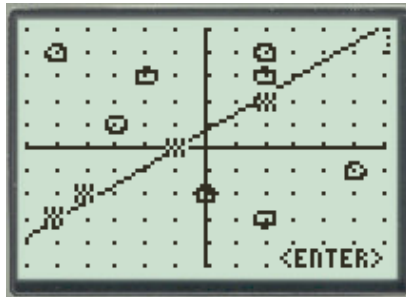
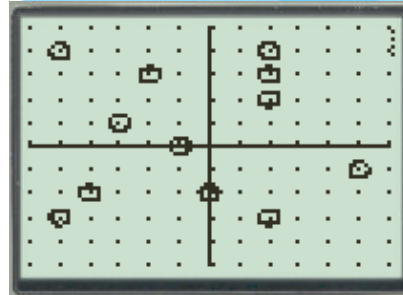
2. Estimate the probability that a Skittle selected at random is orange. What method of probability assignment are you using?
3. The manufacturer claims the distribution is even for all flavors. Use this information to write the probability that a Skittle selected at random is orange. What method of probability assignment are you using?
4. Use your data to estimate the probability that a Skittle selected at random is grape or strawberry.

Example Activities

Exploring Linear Equations

- * Students play Green Globes where they write the equation of a line to hit as many globs as possible.
- * The more points hit with the same line, the higher the score.
- * Groups compete to get the most points after a given number of rounds.

SELECTING
12 GLOBS
< 1 >



GLOBS HIT 4
LINE SCORE 41
TOTAL HITS 4
TOTAL LINES 1
TOTAL SCORE 41
8 GLOB(S) TO GO

Example Activities

Other Ideas

- * Cryptography (inverse functions, inverse matrices)
- * Matching (e.g. equations of lines, rules for exponents, fractions)
- * Sudoku
- * Math Pictionary (draw cards with math properties)

SOME RESOURCES

- * www.flippedlearning.org
- * <http://www.edudemic.com/whats-a-flipped-classroom/>
- * <http://www.scoop.it/t/the-flipped-classroom>
- * <http://www.flippedclassroom.com/>
- * <http://cft.vanderbilt.edu/teaching-guides/teaching-activities/flipping-the-classroom/>
- * <http://cft.vanderbilt.edu/teaching-guides/teaching-activities/flipping-the-classroom/>
- * <http://www.techsmith.com/edu-k12-flipped-learning.html>

THANK YOU!!

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