# ENVISIONING THE FUTURE OF ONLINE MATH DISCUSSIONS

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# THE GOOD…

Image by mohamed Hassan from Pixabay

- Students work at their own pace
- Outside of classroom discussion
- Facilitates peer learning
- Enables students to practice writing
- Involves more introverted students
- Facilitates critical thinking skills

See more detail in Table 1, Aloni et al, 2018.

# THE BAD…

Image by jacky73490 from Pixabay

- Lack of student participation and engagement
- Determining the level and type of instructor involvement
- Students feeling disconnected in the online environment
- Text-only interpretation (lack of emotional cues)

See more detail in Table 1, Aloni et al, 2018.

# THE UGLY…

Hi! I also agree with the thing you said in this discussion board post about the opinion you made up so it sounds like you did the reading!

College discussion board:

Jim: 2+2=4
Me: Wow Jim I totally agree. I like how you added the 2's together and got 4, very insightful.

122K 8:05 PM - Mar 22, 2017

me replying to a discussion board question: therefore whereto whom in conjunction with the assessment is of course the international ramifications that superfluous egregiously in conclusion hitherto admonishing satirically and objectively

14 Tweets about Online Discussion Boards – Brutally Honest https://humansoftumblr.com/14-tweets-about-discussion-boards-that-tell-it-like-it-is/

# Recommendations - Improving Effectiveness in Asynchronous Online Discussions

1. Purpose & Expectation
2. Setting the Structure
3. Effective Question Prompts
4. Facilitation for Engagement


Image by Gerd Altmann from Pixabay

Aloni, M., Harrington, C. (2018). Research Based Practices for Improving the Effectiveness of Asynchronous Online Discussion Boards. *Scholarship of Teaching and Learning in Psychology*. Vol. 4, No. 4, 271–289.

# Recommendation 1 - Communicate Purpose and Expectation

Image by moritz320 from Pixabay

- Explain Value & Importance
- Use Extrinsic Motivation
- Follow Grading Rubric

# Recommendation 2 - Setting the Structure

Image by PublicDomainPictures from Pixabay

- Multiple deadlines
- Allow students to see, read others student's post
- Separate space for social conversation
- Consider alternative discussion structure
- Small group discussions

# Math Strategy : Allow for Corrections

- Encourage growth mindset
- Celebrate mistakes!
- Errors must be corrected

| | |
|---|---|
| Maximum Points | 10 |
| **Accuracy/ Quality of Information Posted** | All of the following are true for submitted work:<br>• Shows appropriate steps taken toward complete solution(s).<br>• Post is free from substantial, uncorrected mathematical errors.<br>• Post is free from substantial, uncorrected content errors. |

Image by Anne & Saturnino Miranda from Pixabay

# Math Strategy : Show Your Work


Image by Gerd Altmann from Pixabay

- Solutions are meaningless without process or interpretation
- Provide guidance:
  - Equation editor
  - Mobile pictures
  - Screenshots
  - Videos

# Math Strategy : Quality Math Conversations

## GUIDED PEER REPLIES

Universal Standard - 3 discussion posts per unit/week.

- Post 1 – New thread
- Post 2 and 3 – Secondary replies to classmate's new threads

Provide prompts for all three posts:

- "Double-Checker" or "Interpreter"
- Advance/extend the conversation – deeper understanding, critical thinking
- Share connection with math concepts
- Open-ended for engagement.

Image by PDPics from Pixabay

# Math Strategy : Teamwork

Image by Anja😷#helpinghands#stayathome #solidarity#stays healthy🙏 from Pixabay

## Research says:

- Difficult to keep track of extensive linear discussion
- Information overload
- Making connections across posts is hard

## Additional reasons:

- Reducing isolation
- Math is an applied science
- Fulfill general education competencies

# College Algebra: Secret Spy Team

Image by Benjamin Nelan from Pixabay

1. Each team member encodes one detail of secret meeting
   - Location, Where to Be, Time, What to Bring, What to Wear, What to Do, Password to Say, Password to Reply
2. Classmate decodes message
3. Summary

**Numerical Look-Up Table:**

| | |
|---|---|
| A | 1 |
| B | 2 |
| C | 3 |
| D | 4 |
| E | 5 |
| F | 6 |
| G | 7 |
| H | 8 |
| I | 9 |
| J | 10 |
| K | 11 |
| L | 12 |
| M | 13 |
| N | 14 |
| O | 15 |
| P | 16 |
| Q | 17 |
| R | 18 |
| S | 19 |
| T | 20 |
| U | 21 |
| V | 22 |
| W | 23 |
| Y | 24 |
| X | 25 |
| Z | 26 |
| SPACE | 27 |

# Let's have a Potluck! CODING

What FOOD can YOU bring to the potluck?

Coding function; f(x) = 2x

**Example:**

1) Write out your food

2) Make the letters into numbers

C = 3

3) Encrypt each number

double each number f(x) = 2x.

Image by jinsoo jang from Pixabay

| | | | | | | |
|---|---|---|---|---|---|---|
| C | O | O | K | I | E | S |
| 3 | 15 | 15 | 11 | 9 | 5 | 19 |
| | | | | | | |

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| 6 | 30 | 30 | 22 | 18 | 10 | 38 |

# Potluck Picnic Time

https://docs.google.com/document/d/1qZiOOQssJQ2eHp8ggeqgR6NVUQrEIBMgJrJ9v3b5EImA/edit?usp=sharing

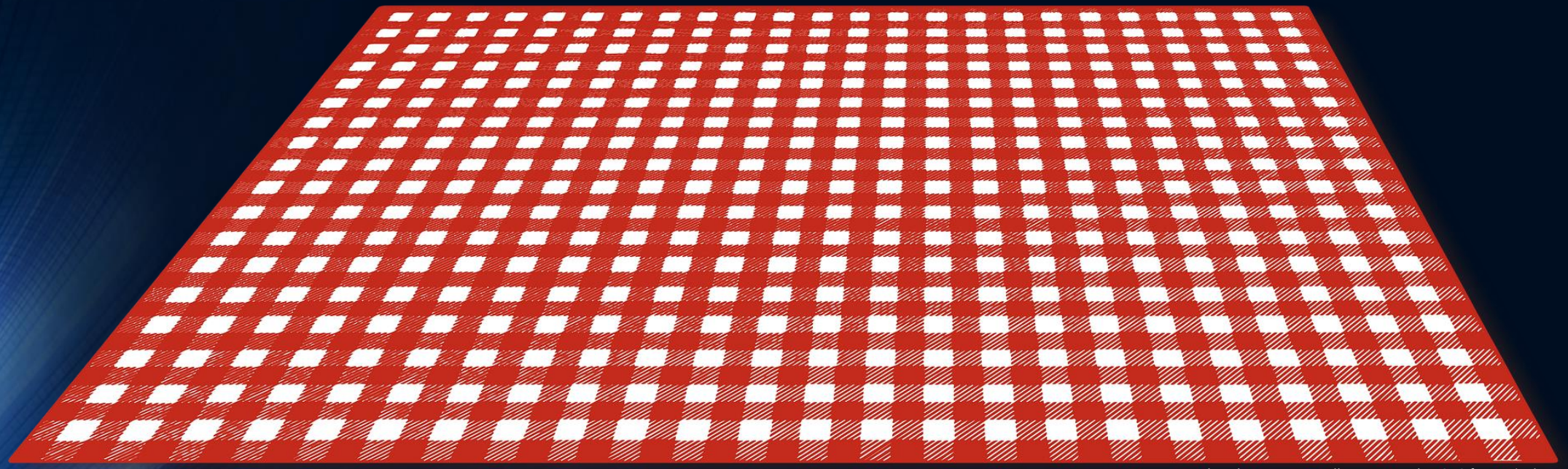

Image by Please Don't sell My Artwork AS IS from Pixabay

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# Let's have a Potluck!
# DECODING

What FOOD can YOU bring to the potluck?

Decoding function; $g(x) = \frac{x}{2}$

**Example:**

3) Write out the encrypted message

2) Decrypt each number

Divide by 2 each number $g(x) = \frac{x}{2}$

1) Make the numbers into letters

3 = C

Image by jinsoo jang from Pixabay

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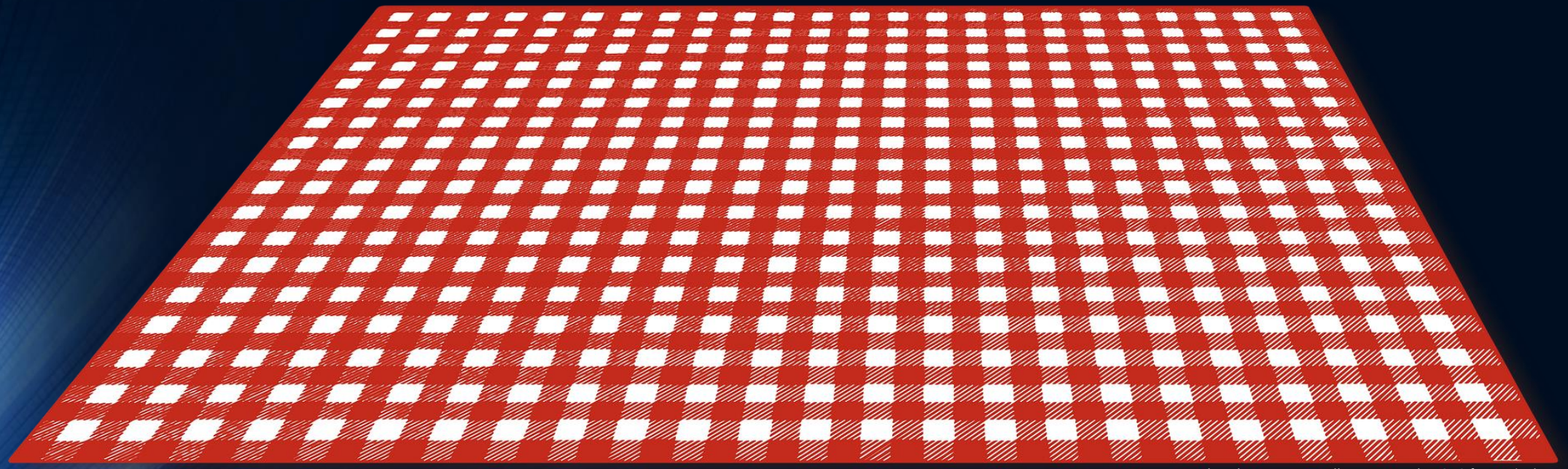


Image by Please Don't sell My Artwork AS IS from Pixabay

# Recommendation 3 - Effective Question Prompts

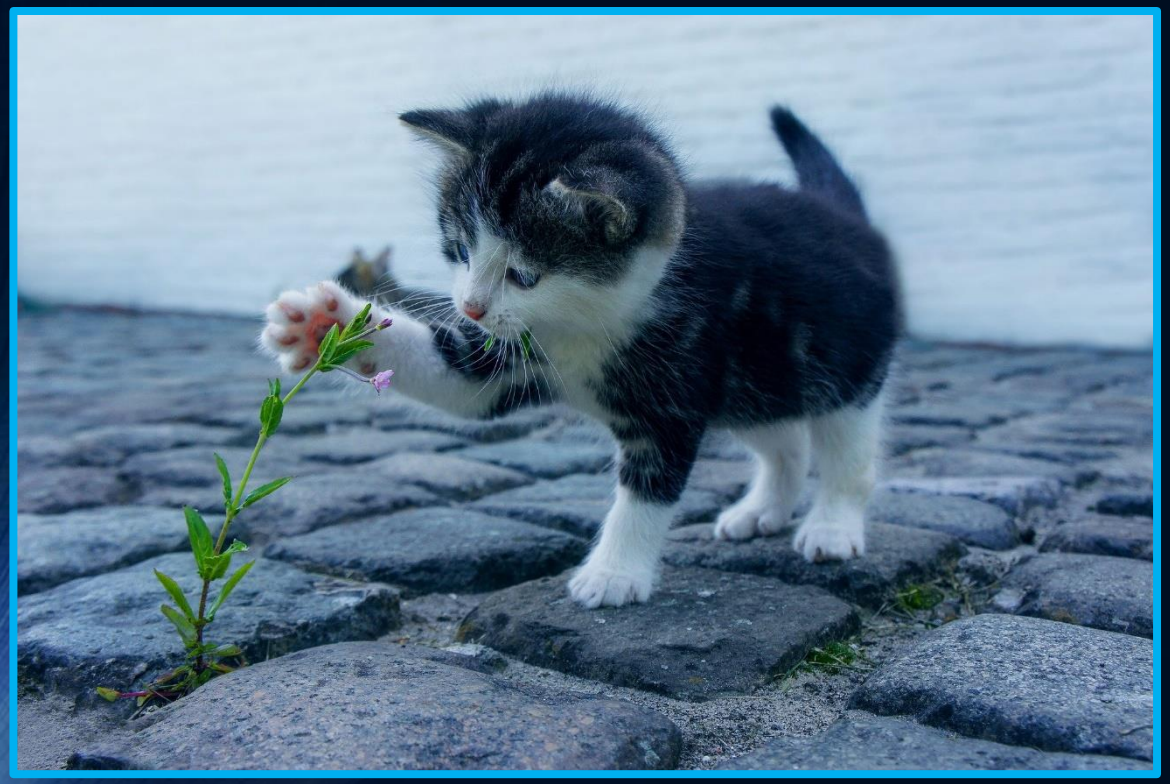


Image by Dimitri Houtteman from Pixabay

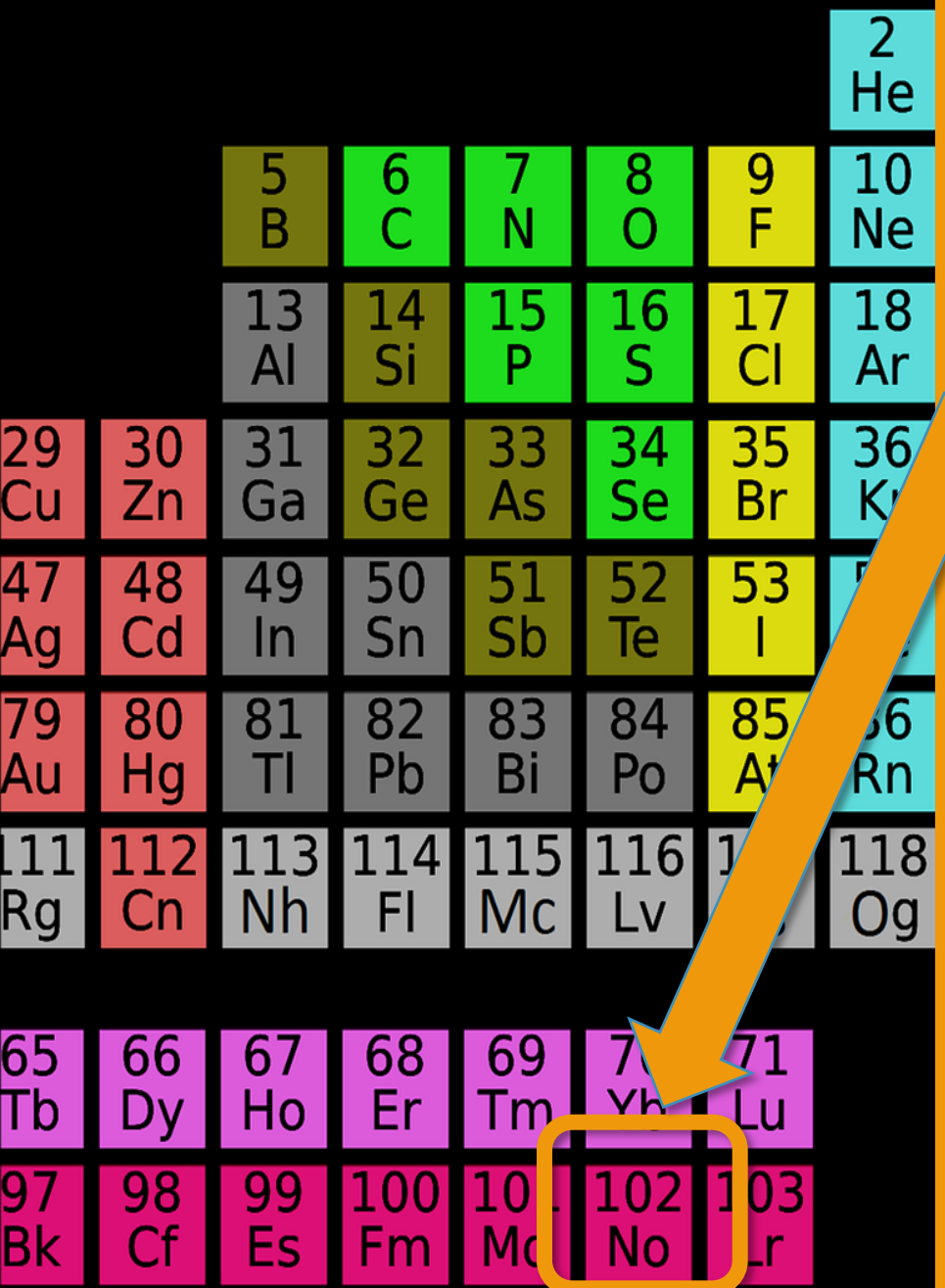
- Target Bloom's highest level of critical thinking
- Authentic Real-World Scenarios
- Divergent questions
- Variety is the key to life!
- Use Video or Pictures

# Recommendation 4 - Facilitation for Engagement

- Active instructor
- Quality vs quantity
- Assign student roles
- SC+Q approach

Image by Tatyana Kazakova from Pixabay

Image by ExplorersInternational from Pixabay




# Word Problems

Nobelium, an element discovered in 1958, has a half-life of 10 min under certain conditions. In a sample containing 1 g of nobelium, the amount left after t min is given by $A(t) = (0.5)^{t/10}$. (Round to three decimal places.)

- How much nobelium is left after 5 min?
- How much nobelium is left after 1 hr?

Published in Beginning and Intermediate Algebra (Miller, 2018)

# Math Strategy: Authentic Situational Tasks

Image by pen_ash from Pixabay

*"genuine problems that arise outside the classroom for which mathematics is useful or they are social issues that students can learn more about through mathematical analysis".*

*(Felton, 2014)*

# College Algebra - Why can't I sleep?


Image by Atlantis Curry from Pixabay

The half-life of caffeine is about 5.7 hours. This means that half of the caffeine intake will still be in your system after 5.7 hours.

Consider bedtime at 9pm. How much caffeine would remain in their system if

- You drank it between 11-2 (lunch time)?
- You drank it between 3-6 (dinner time)?
- Share some advice to others based on your calculations.

# Survey of Math: Playground-Style

Image by Rudy and Peter Skitterians from Pixabay

Your friend's home flooded recently, and all her furniture was ruined… You have been tasked with estimating how much money should be raised for help.

Explore living room furniture purchase options online. Choose at least six pieces of furniture. In your post, you will list each item, include the item URL, and include the approximate cost of the item rounded to the nearest $100. Calculate the estimated total of your purchase.

# Survey of Math: Focal-Point

Propose a community program that you would like to kick start. Choose something you are passionate about…

- A brief overview of the community program
- Proposed budget percentages to help prepare for fundraising (administrative costs, supplies, rent, advertising, etc.).
- Proposed number of volunteers. Also calculate the percentage of volunteers based on total number of people in the community.
- Estimated percentage of people (or animals) in the community that would benefit from the program.

Image by Free-Photos from Pixabay

# Discrete Math: Role-Playing

Image by telophase from Pixabay

You are working as an IT consultant that is known to have keen mathematical skills in addressing real world situations. You have recently been contacted by a city council to present a plan for a population growth/decline initiative. The council has in recent years experienced considerably unexpected changes in population that has left them scrambling to find remedies for the city (e.g. new roads if population is growing, repurpose vacant lots if population is declining).

You will spear-head this initiative, and you are charged with planning a mathematical model for future use and prioritizing the city council's use of technology.

# Math Strategy - Thwarting Plagiarism

Image by Pexels from Pixabay

- Require current data acquired via Internet
- Use information unique to each student
- Use class generated data

# Business Analytics – Current & Unique Data

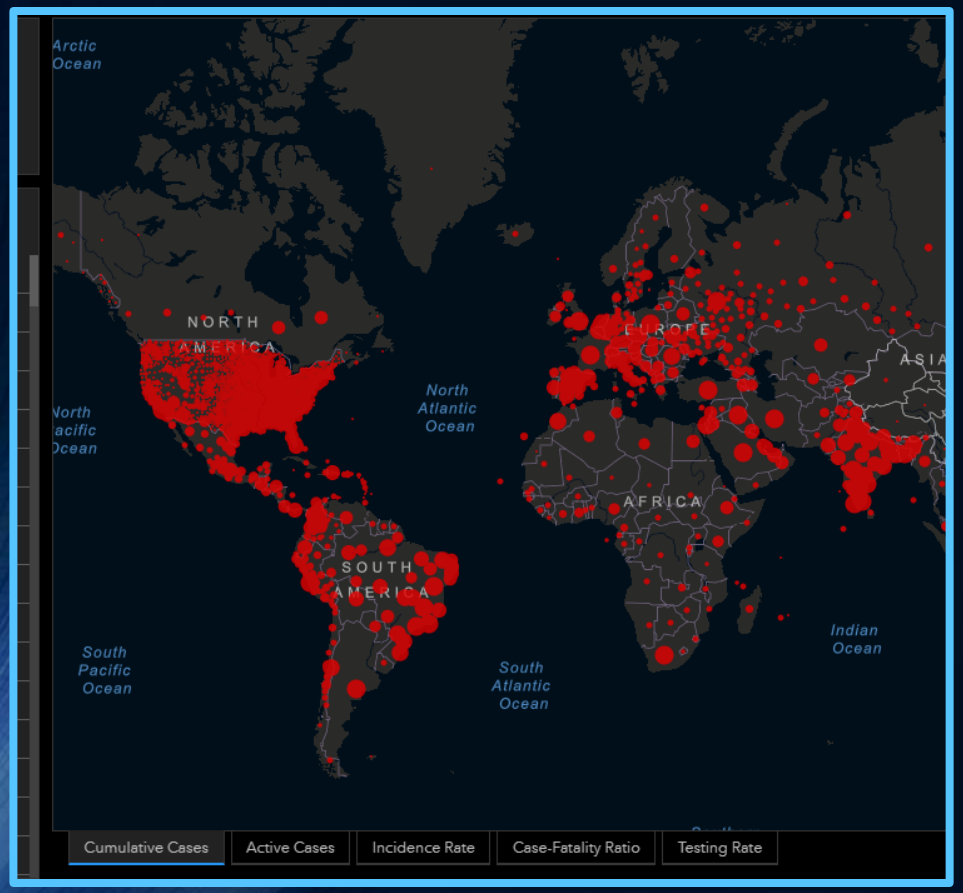
Image by Tumisu from Pixabay

Explore recent polls at
http://www.pollingreport.com

Search the site and find a poll where the sample size and margin of error are given.

- Interpret the results of your … the sample size n, and the margin of error MoE (also known as sampling error).
- State the confidence interval using the given MoE and statistics shared.
- Calculate the confidence interval based on a 95% formula
- How does this compare with the Website?

# College Algebra – Current & Unique Data




## COVID19 Growth - New Cases by County

- Download unique data by county from Johns Hopkins COVID Dashboard available at: https://github.com/CSSEGISandData/COVID-19
- Student will download most recent 30 days
- A little Excel magic to find new cases per day
- A little more Excel magic to graph a visual of new cases per day
- Compare/discuss their data against linear and exponential growth

# Selected References


Aloni, M., Harrington, C. (2018). Research Based Practices for Improving the Effectiveness of Asynchronous Online Discussion Boards. *Scholarship of Teaching and Learning in Psychology.* Vol. 4, No. 4, 271–289.

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# THANK YOU!!

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