

Lesson 5:

Eutrophication and algal blooms...

why too many nutrients can be a bad thing.

Stop and Jot:

When is too much of a good thing a bad thing?

Now, Turn and Talk and share your thinking with a partner.

Group discussion and sharing:

Each group review your main conclusions or claims about the relationship between increased rainfall and water quality. Be ready to share your thinking.

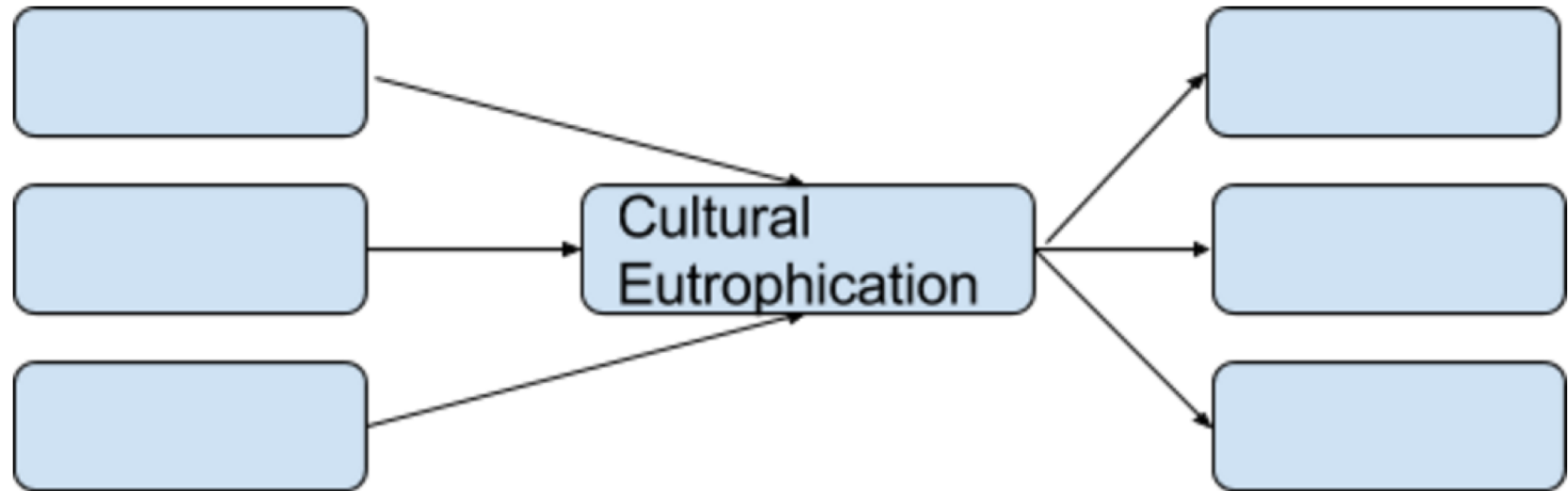
Class check-in: What substances in the water increased after heavy rainfalls?

Table Talk:

So what? Nutrients are necessary for life, so when would very high levels of nutrients in water be a bad thing? What problems might this cause?

As a group, make a prediction and be ready to share.

Cause and Effect:



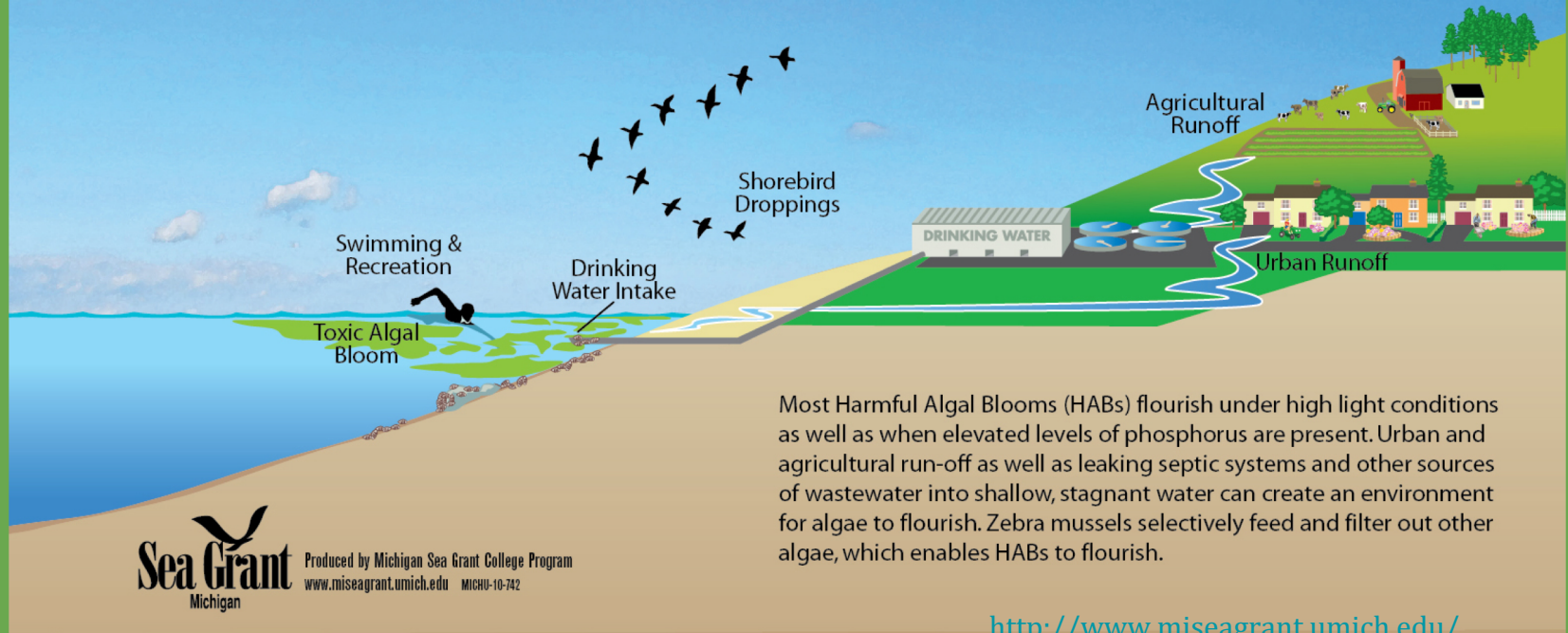
Infographic analysis:

For each infographic you are about to see, talk with a partner about the following questions and be ready to share your thinking:

1. What is the “story” being told? What is being explained?
2. What types of images are being used and how do they help tell the “story” or develop the explanation?
3. What type of data are included, if any? If there are data, how do they help tell the story or explain something?
4. How are the different parts of the infographic (images, data, printed



Factors Influencing the Growth of **HARMFUL ALGAL BLOOMS**



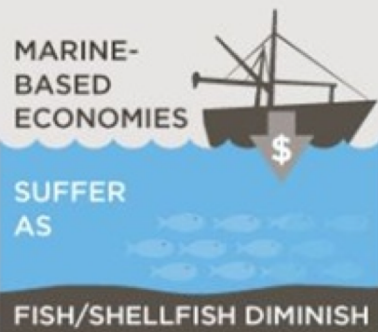
Most Harmful Algal Blooms (HABs) flourish under high light conditions as well as when elevated levels of phosphorus are present. Urban and agricultural run-off as well as leaking septic systems and other sources of wastewater into shallow, stagnant water can create an environment for algae to flourish. Zebra mussels selectively feed and filter out other algae, which enables HABs to flourish.



WHAT IS THE RISK FOR OUR REGION IN THE FUTURE?

IF WE DON'T ACT NOW, THE COSTS AND CONSEQUENCES WILL GROW.*

OCEANS



RIVERS & STORMS



INCREASE IN SEVERE STORMS



MOUNTAINS

AVERAGE WASHINGTON SNOWPACK



PNW ACRES BURNED BY **WILDFIRES** EVERY YEAR

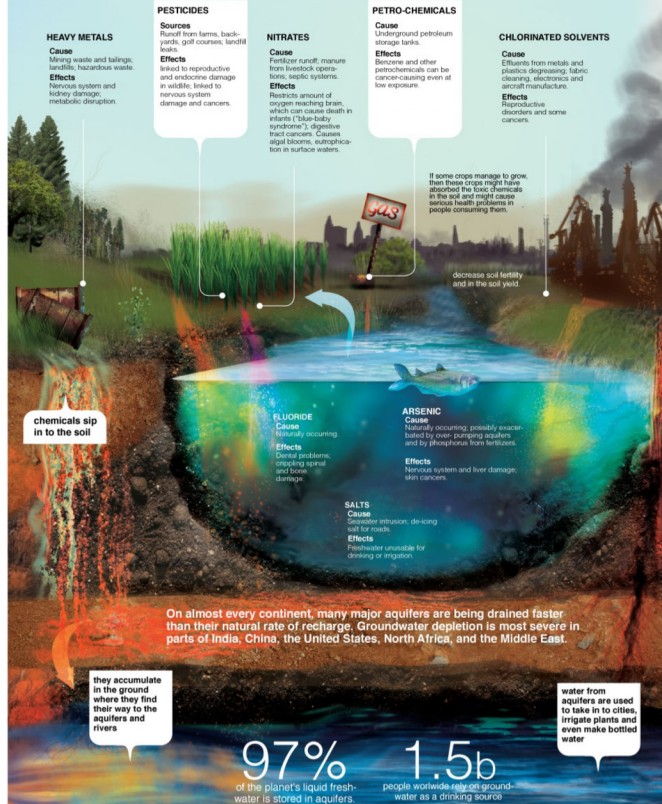


YOU DON'T SEE IT, BUT IT'S THERE



Contamination results when hazardous substances are spilled or buried in the soil. It can also occur when pollutants settle on the soil, such as chemicals or industrial smokestack. Plants in contaminated soil absorb hazardous substances. Humans or animals ingest these plants may get sick, they can also inhale soil contaminants through dust that is present in the air or absorb these hazardous chemicals through their skin.

The availability of clean water has come to be recognized as perhaps the most critical of all human security issues facing the world in the next quarter-century. New research finds that groundwater is dangerously threatened. Worldwide, 97 percent of the planet's liquid freshwater is stored in aquifers.



THE MURKY FUTURE OF GLOBAL WATER QUALITY

The world is on a path toward rapidly deteriorating water quality levels in many countries that will increase risks to human health, economic development and ecosystems.



TODAY



2050

In 2050, more people will be at high risk of water pollution due to increasing BOD, Nitrogen and Phosphorus.

BOD

Biochemical Oxygen Demand (BOD)

BOD is the amount of dissolved oxygen required by microorganisms in the water to break down organic material.



Drier future in 2050*



1 in 5 people (1.6 billion)
an increase of 144%

Wetter future in 2050*



1 in 6 people (1.4 billion)
an increase of 111%

Nitrogen (N) & Phosphorus (P)

N and P are essential nutrients for sustaining life and aquatic ecosystems. However, too much N and P equates to pollution, often resulting in eutrophication, when algae is stimulated by unusually enriched nutrients, grows faster than normal and kills other aquatic life by depleting oxygen. High levels of nitrogen-based compounds in drinking water can be harmful to human health.



1 in 3 people (2.6 billion)
an increase of 172%



1 in 4 people (2.3 billion)
an increase of 138%



1 in 3 people (2.9 billion)
an increase of 129%



1 in 3 people (2.5 billion)
an increase of 96%

BOD

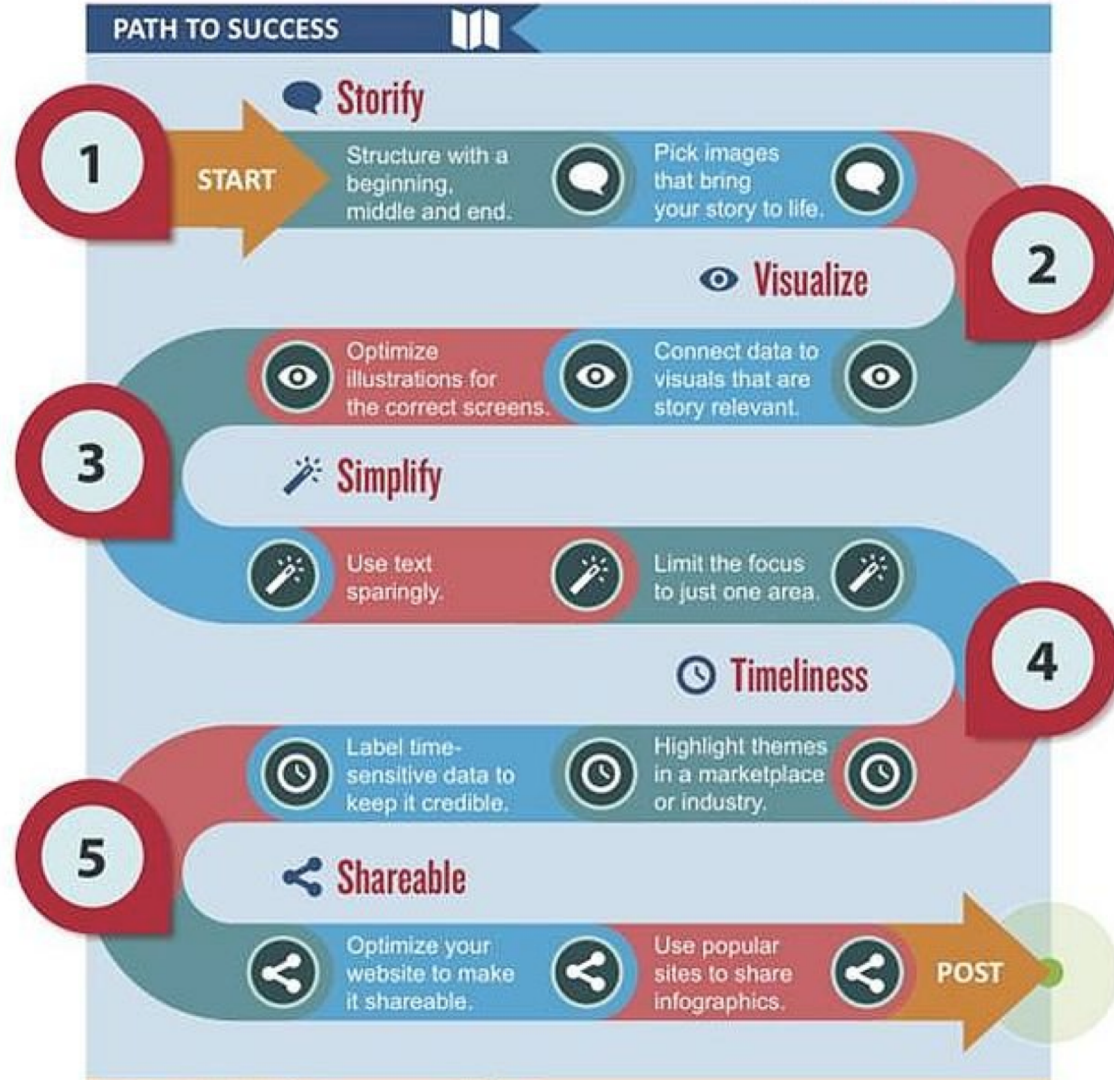
N

P

*Projections based on anticipated moderate economic and population growth, climatic changes projected by the CSIRO (dry) and MIROC (wet) climate change models, and corresponding agricultural activity increases forecast by IFPRI. Model uses latest available global base period data (2000-2005) for BOD, N and P.

Infographic basics....

The next slide presents the basic components of a good infographic:



How does climate change appear to be affecting the Lake Erie watershed?

In particular, what is the relationship between increasingly severe rain events and water quality on the Lake Erie watershed?

How can I explain and represent this relationship?

What you need to have in YOUR infographic:

1. A “story” or explanation with a beginning, a middle, and an end
2. Images that help make this story visible and more clear, that “bring it to life”
3. Data that are well organized and that support the visuals and add support to the story or explanation
4. Limited use of text that help develop the explanation.. not too much, but just enough
5. Use of organization, structure, and visuals to highlight a main message or take away that answers the essential question
6. Sources of information should be listed at the bottom, but they can be small!