BOWLAND MATHS

Purpose

- Establish the context:
  - o Region, countries and water issues
  - o Understand the value of the case.

- Establish the goals of the case:
  - o Develop the best possible argument
  - o Make an objective evaluation of all arguments (their assigned country may not have the best argument).

- Use data-based reasoning
  - o Make simple comparisons, then realize the limits of these simple comparisons.
  - o Foreshadow lesson 2, which will introduce the importance of compound measures (per capita) for making fair comparisons.

Preparation

Prepare the materials as outlined in *Resources*
Have a computer, speakers, and projector to show the WWRB video
Consider the best teaming strategy for your students
Optional: review *Supports.doc* for extension activities relevant to this lesson

Organization and Pedagogy

Introduce; Whole Class   20 minutes
- Introduce the letter from JT Smith.
- Show the video.   Discuss.
- Distribute the *Analysis Guide* (either the required pages, or the entire guide)

Hypothesize; Whole Class   5 minutes
- Discuss Reflection question.

Investigate; Small Group   20 minutes
- Groups complete *Understanding the data* sheets. Monitor understanding.

Reflect; Whole Class   10 minutes
- Review answers in *Reflection*.
- Assign *Making the Headlines* for homework.

Resources: required

Welcome Letter, 1 per group
    Filename: Letter Welcome.pdf

Analyst's Guide (pp. 1-4), 1 for each student
    Filename: Analyst's Guide.doc

World Water Resource Board video,
    Filename: WWRB Video.mp4 (projected);
    Video Script.doc (for teacher only)

Data table, 1 for each small group
    Filename: WWRB Data Table.pdf

Image Gallery, 2 per class or electronically
    Filename: WWRB Gallery.ppt

Resources: optional

Glossary, 1 for each group
    Filename: WWRB Glossary.doc

Country videos, made available on computers
    Filenames: WWRB Video Algeria.mp4;
    WWRB Video Jordan.mp4;
    WWRB Video Turkey.mp4;

Maps, 1 for each group
    Filenames : Map World.pdf; Map Region.pdf;

Country Maps, 1 for corresponding group
    Filenames : Map Algeria.gif; Map Jordan.gif;
     Map Turkey.gif

Datasheet, provided electronically
    Filename: WWRB Datasheet.xls

Headlines worksheet, provided electronically
    Filename: Headline.doc

BOWLAND MATHS

Purpose

- Deepen understanding of data use:
  o To develop an argument
  o To see how data can be misused
  o To be critical about how data is used.

- Understand compound measures:
  o Explore combining measures
  o Identify measures that can be combined to make fair comparisons
  o When compound measures are appropriate

Preparation

Prepare the materials as outlined in *Resources*
Have computers with Excel available for student use (students use in small groups)
Ensure that country data files are on the computers and accessible to students
Optional: review *Supports.doc* for extension activities relevant to this lesson

Organization and Pedagogy

Introduce; Whole Class   10 minutes
- Review homework.
- Discuss "Points to ponder" and letter from JT Smith.

Hypothesize; Small Group   15 minutes
- Provide groups with appropriate country applications.
- Students complete *Evaluating the Application*. Monitor understanding.
- *Optional:* can use Excel worksheets for the data table and for the

Investigate; Small Group   30 minutes
- Groups complete *Using Compound Measures*. Monitor understanding.
- *Optional:* can use Excel worksheets

Reflect; Whole Class   5 minutes
- Discuss sensible and nonsensical measures, appropriate and inappropriate measures.

Resources: required

Analyst's Guide (pp. 5-7), 1 per student
    Filename: Analyst's Guide.doc

Applications Letter, 1 per group
    Filename: Letter Applications.pdf

Country Applications, 1 per group
    Filenames: Application Algeria.pdf;
    Application Jordan.pdf; Application
    Turkey.pdf

Resources: optional

Glossary, 1 for each group
    Filename: WWRB Glossary.doc

Datasheet, provided electronically
    Filename: WWRB Datasheet.xls

Country Data Sets, electronic, on computers
    Filenames: Applications All Countries.xls

Data Table, 1 for each group
    Filename: WWRB Data Table.pdf

BOWLAND MATHS

Purpose

- Use data as evidence

- Create a poster showing the best possible argument for their assigned country

- Have students articulate their arguments and the connection to maths

Preparation

Prepare the materials as outlined in *Resources*
Have poster materials prepared for each group
Optional: review *Supports.doc* for extension activities relevant to this lesson

Organization and Pedagogy

Introduce; Whole Class   5 minutes
- Go over the note from JT Smith on page 8 of the Analyst's Guide. Inform students that they will be making posters.

Hypothesize; Individual or Whole Class   5 minutes
- Discuss question 1 on page 8.

Investigate; Small Group   50 minutes
- Groups complete *Developing an Argument*, pages 8-9 of the Analyst's Guide.
- Groups create posters.

Reflect; Individual   Homework
- Students complete *Reviewing Your Work* on page 10 of the Analyst's Guide.

Resources: required

Analyst's Guide (pp. 8-10), 1 per student
    Filename: Analyst's Guide.doc

Data Table, 1 for each group
    Filename: WWRB Data Table.pdf

Sample Poster, 1 for each group
    Filename: Poster Sample.pdf

Poster board and materials, enough for all

Image Gallery, 2 per class, or electronically
    Filename: WWRB Gallery.ppt

Resources: optional

Glossary, 1 for each group
    Filename: WWRB Glossary.doc

Datasheet, provided electronically with access to computers & Microsoft Excel
    Filename: WWRB Datasheet.xls

Maps, 1 for each group
    Filenames : Map World.pdf; Map Region.pdf;

Country Maps, 1 for corresponding group
    Filenames : Map Algeria.gif; Map Jordan.gif; Map Turkey.gif

BOWLAND MATHS

Purpose

- Present and evaluate country arguments
- Determine which argument(s) are best supported by data
- Reflect on the case, and its relevance to maths

Preparation

Prepare the materials as outlined in *Resources*
Prepare the room for a poster walk
Have larger stickies for students to comment
Have smaller stickies for students to vote

Organization and Pedagogy

Introduce; Whole Class or Small Group   5 minutes
- Students hang posters and are given stickies for comments.

Investigate; Individual   10 minutes
- Students evaluate posters, using the *Poster Walk Table* on page 11
- Students also post questions and comments they have, using the stickies.

Reflect; Whole Class   15 minutes
- Students review what they learned, and discuss common questions they have.

Investigate; Individual   5 minutes
- Students are given one small stickie and use it to vote on the best argument.

Reflect; Whole Class   25 minutes
- Discuss how data can be used in an argument, and the role of compound measures.
- Discuss how this water availability case is relevant to maths.

Resources: required

Analyst's Guide (p. 11), 1 per student
    Filename: Analyst's Guide.doc

Congratulatory Letter, at least 1 for the class
    Filename: Letter Congratulations.pdf

Large stickies, several per student

Small stickies, one per student

Resources: optional

Data Table, at least 1 for the class
    Filename: WWRB Data Table.pdf

Maps, 1 for each group
    Filenames : Map World.pdf;   Map Region.pdf;

Country Maps, 1 for each country group
    Filenames : Map Algeria.gif; Map Jordan.gif;
     Map Turkey.gif