

## **Watersheds and Stream Flow Lesson Plan**

**Grade level(s): 9**

**Standards Met:**

4.2.10A

- Describe how topography influences the flow of water in a watershed.
- Describe how vegetation affects water run-off.
- Investigate and analyze the effects of land use on the quality of water in a watershed.

**Objectives:**

- Define streamflow.
- Define Flashflood.
- Identify the USGS stream gauges for Indiana County.
- Analyze the data from USGS streamflow gauges for Indiana County streams.
- Use streamflow data to identify flood and drought events.

**Materials:**

- Chromebook with internet access.
- Handout

**Procedures:**

*Engage:* Show video footage: <https://www.youtube.com/watch?v=cxAUoXTUtS8>

Discuss meaning of flashflood and the concept of streamflow.

*Explore:* Assign handout concerning stream gauges in Indiana County. Students will work independently.

*Explain:* Students will answer questions about current stream conditions.

*Elaborate:* Students will research flood events and correlate streamflow data to the flood.

*Evaluate:* Students will complete the handout.

**Anticipated Problems & Adaptations:**

Internet issues.

**Resources:**

[www.usgs.gov](http://www.usgs.gov) surface data for PA

Watersheds Unit: Stream Flow Worksheet

- Identify the unit used to describe stream flow:
- Go to the USGS website and identify the five stream flow gauges in Indiana County. <https://waterwatch.usgs.gov/?m=real&r=pa>  
Complete the rest of the table using information from each gauges data page.

Gauge Name	Drainage Area (mi <sup>2</sup> )	Current Streamflow (cfs)	Median Streamflow for date

- Compare the currently displayed hydrographs for these stations. Write at least three sentences.
- Explain the color coding system used by the USGS for streamflow.
- Select one of the Indiana County gauges and obtain the hydrograph for last summer (2016) and for the summer of 2015. Use June-August data. Copy and paste those hydrographs here or print them. Compare and contrast the data.

- Select one of the gauges and obtain the summary of peak streamflow by clicking the link that looks like:

**[Summary of all available data for this site](#)**

When did the highest streamflow ever take place for this station? Do some research and find out what happened that year to cause such high stream flow. Report that here including at least a few historical pictures from the county applicable to what you found out.