ENHANCING DATA LITERACY
DATA LITERACY

Kahoot.it
DATA LITERACY
The ability to read, work with, analyze, and argue with data.

Source: Bhargava and D'Ignacio, Designing Tool and Activities for Data Literacy Learners
DIGITAL LITERACY
The ability to use information and communication technologies to find, evaluate, create, and communicate information.
TUCSON GATHERS STEAM IN 2016
How Did Tucson's Economy Perform Last Year?

LEARN MORE
3rd Grade Students who scored Proficient or Higher on the AzMERIT English Language Arts Test (2016)
<table>
<thead>
<tr>
<th>ECONOMY</th>
<th>EDUCATION</th>
<th>HEALTH &amp; SOCIAL WELL-BEING</th>
<th>INFRASTRUCTURE</th>
<th>QUALITY OF PLACE</th>
<th>WORKFORCE &amp; DEMOGRAPHICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Growth</td>
<td>College Major</td>
<td>Cost of Living</td>
<td>Air Travel</td>
<td>Air Quality</td>
<td>Employment Share by Industry</td>
</tr>
<tr>
<td>Employment Growth by</td>
<td>Educational Attainment</td>
<td>Health Insurance Coverage</td>
<td>Commute Time</td>
<td>Bicycling Capacity</td>
<td>Labor Force Participation Rate</td>
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<tr>
<td>GDP by Industry</td>
<td>High School Graduation</td>
<td>Housing Cost Burden</td>
<td>Energy Use</td>
<td>Jobs in Leisure &amp; Arts</td>
<td>Occupational Wages</td>
</tr>
<tr>
<td>Median Home Price</td>
<td>PreK-12 Enrollment</td>
<td>Poverty Rate</td>
<td>Internet Access</td>
<td>Outdoor Recreation</td>
<td>Population Profile</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>Student Achievement</td>
<td>Primary Care Access</td>
<td>Residential Water Use</td>
<td>Public Safety</td>
<td>Wage Distribution</td>
</tr>
<tr>
<td>Patents</td>
<td>Teacher Wages</td>
<td>Teen Birth Rate</td>
<td>Transportation to Work</td>
<td>Voter Turnout</td>
<td>Working Age College Graduates</td>
</tr>
</tbody>
</table>
An economy is defined by the production, distribution, and consumption of goods and services. The decisions of individuals and firms interacting in this process determine how economic resources are allocated. The quality of a region’s economy reflects the opportunities available to individuals and businesses. Strong economies typically result in a high standard of living, higher wages, and consistent job growth. Stable economies include a diverse mix of industries offering a wide range of jobs with varying skill requirements. Improving the economic performance and opportunities within a region are often the primary goal of civic leaders and elected officials. The economic indicators included in this section help identify where Southern Arizona stands in comparison to other economic regions in western United State.
Growth Rate of Total NonFarm Employment (2016)

Why is it important?

The rate at which total employment changes is a key indicator of the overall performance of an economy. Employment growth reflects a region’s ability to generate jobs, income, and economic opportunities for those living in that region. Slow job growth can lead to increases in unemployment, reduced wages for those employed, and a decline in overall economic growth. Employment growth, subdivided by industry, informs us what industries dominate the employment mix and how that mix is changing over time.

How do we compare? What are the key trends? How is it measured?
Maps below are interactive, scroll over the geography names to compare the growth rate of total nonfarm employment. The U.S. nonfarm employment growth rate in 2016 was 1.7%.
The History
Guide on the Side Library Tutorial

- Population
- GDP
- Unemployment
- Labor Force Participation Rate
Guide on the Side Library Tutorial

American FactFinder

Community Facts
Find popular facts (population, income, etc.) and frequently requested data about your community.

Guided Search

Advanced Search

Download Center

Popular Tables

Population and Housing
- Annual Population Estimates (2010 PER, PEPANNRES)
- Demographic and Housing Estimates (2015 ACS, DP05)
- General Housing Characteristics (2015 ACS, DR04)

Poverty and Income
- General Economic Characteristics (2015 ACS)

Age, Race, Sex and Education

DATAZOA™: Accessing the U.S. Census Bureau

Working with the Data

3 of 3
Your Chart should look like the one below

Next
Assessment of Student Learning

DATAZOA™: ECONOMIC INDICATOR RESEARCH WITH THE BEA

Explore Data
2 of 2

Prior to 2015, which year had the highest personal income growth?

- 2008
- 2001
- 1994

Check answer

DATAZOA™: ACCESSING THE U.S. CENSUS BUREAU

Quiz

Which of the following is NOT TRUE regarding GroupLists in dataZoa™?

- GroupLists are an ordered collection of series keys used to organize sets of data
- GroupLists can be renamed
- Good naming conventions for GroupLists include: Indicator name, geography, frequency, and source
- GroupList names are imported from the data source when a data set is uploaded from the internet.

The Census Bureau takes a complete population count every ______ years.
Digital Badges

★ ★ Challenges

• Complete a library tutorial on how to use dataZoa. Download and manage economic indicator datasets. Create a table and chart to visualize data trends. Score 80% or above on the summative quiz.

Attached Resources

Tutorials: dataZoa™...
http://www.library.a...
Online Learning
Webquests

Information for Decision Making

"Without data you’re just another person with an opinion."
– W. Edwards Deming

Welcome: Information for Decision Making
Description: Using open data sources, students will perform web-based demographic, economic, and business research to gather relevant indicators that will assist them in developing a retail strategy.
Grade Level: College / Adult
Curriculum: Business / Economics
Keywords: open data, retailing
Author(s): Laurie Sheldon
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Digital Badges

Data Designers — Atelier

The earner of this badge has demonstrated proficiency in identifying and evaluating sources of Open Economic Indicator Data. In creating a dynamic Open Dataseries workbench utilizing a cloud-based data management tool, dataZoa™, in interpreting the Open Data to formulate opinions relating to retail and consumer economics, and in defending those opinions with visual displays of the datasets.

 Challenges

- Construct and utilize a functional dataZoa™ workbench of Open Data

Innovator
Couture
Stylist
Face-to-Face Classroom

Photo: geekymomblog.com
### Demographic Profile

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Total Population Estimate</td>
<td>70,520</td>
<td>71,676</td>
<td>72,482</td>
<td>73,356</td>
<td>74,180</td>
</tr>
<tr>
<td>% Chg from Year Ago</td>
<td>1.64%</td>
<td>1.1%</td>
<td>1.23%</td>
<td>1.12%</td>
<td></td>
</tr>
<tr>
<td>Percent of Population by Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>55.7</td>
<td>54.7</td>
<td>54.9</td>
<td>54.1</td>
<td>54.0</td>
</tr>
<tr>
<td>Female</td>
<td>44.3</td>
<td>45.3</td>
<td>45.1</td>
<td>45.9</td>
<td>46.0</td>
</tr>
<tr>
<td>Median Age</td>
<td>37.1</td>
<td>37.2</td>
<td>37.7</td>
<td>38.7</td>
<td>39.9</td>
</tr>
<tr>
<td>Percent of Population by Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 years and over</td>
<td>76.8</td>
<td>76.3</td>
<td>76.1</td>
<td>76.0</td>
<td>76.0</td>
</tr>
<tr>
<td>21 years and over</td>
<td>74.1</td>
<td>73.4</td>
<td>73.5</td>
<td>73.4</td>
<td>73.5</td>
</tr>
<tr>
<td>62 years and over</td>
<td>10.9</td>
<td>11.1</td>
<td>12.1</td>
<td>13.3</td>
<td>14.5</td>
</tr>
<tr>
<td>65 years and over</td>
<td>8.9</td>
<td>9.1</td>
<td>9.6</td>
<td>10.6</td>
<td>11.3</td>
</tr>
<tr>
<td>Percent of Population by Race &amp; Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>71.5</td>
<td>72.0</td>
<td>71.0</td>
<td>70.3</td>
<td>71.3</td>
</tr>
<tr>
<td>Black or African American</td>
<td>6.7</td>
<td>6.3</td>
<td>6.1</td>
<td>5.8</td>
<td>4.8</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
<td>0.4</td>
</tr>
<tr>
<td>Asian</td>
<td>13.4</td>
<td>13.2</td>
<td>13.7</td>
<td>14.1</td>
<td>14.4</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6</td>
<td>0.4</td>
</tr>
<tr>
<td>Some other race</td>
<td>4.8</td>
<td>4.1</td>
<td>4.0</td>
<td>4.1</td>
<td>3.7</td>
</tr>
<tr>
<td>Two or more races</td>
<td>2.5</td>
<td>3.2</td>
<td>4.1</td>
<td>4.5</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Source: American Community Survey 5 YR Estimates

Published by amalgam.
Developing a Persona

Fresno Persona

Name: Kathy
City/State: Fresno city, CA
Age: 30
Gender: Female
Race/Ethnicity: White
Marital Status: Married
Family Type: No children under 18 living at home

Education: Some college, no degree
Household income in the past 12 months: $50,000–$74,000
Location of home: suburban
No. of vehicles in household: 2
Religion: Unclaimed

Occupation: Education, training and library occupations
Industry: Health care and social assistance
Profession: House health aide
Place of Employment: CA

Transportation to work:
• Drives a vehicle
• Drives alone
Commute Time:
• Leaves between 9:00 am–11:59 pm
• Commute time is 15 to 19 minutes
Developing a Persona

How to Successfully Advertise to Her

- Ads on the radio, Pandora, Spotify since she spends about 2hrs each day in the car, plus time in the morning getting ready
- Commercials on the TV news in the morning or shows like The View, Live with Kelly - because they're credible/knowledgeable and she is skeptical towards advertising
- In-store promotions & Ads while doing shopping in places like Target or Bed, Bath & Beyond for items like the Shark, Keurig, or Instiller
Median household income is one measure, among many, that gauges the economic well-being of a region. Median household income provides information about the financial resources available to households. Higher household incomes are commonly associated with a greater means of acquiring goods and services. Household income is closely tied to employment levels, educational attainment, and regional economic opportunities.

**Household income** includes the sum of income earned by individuals 15 years and older living in a household during the calendar year, whether they are related to the head of the householder or not. Median Household Income data is from the Census Bureau’s American Community Survey (ACS). The ACS is a nationwide rolling-sample survey that produces one and five-year estimates on demographic, social, housing, and economic measures. Data provided in this analysis utilized five-year estimates.
Learning Outcomes

The ability to

- Find
- Evaluate
- Create
- Communicate data.
Project Metrics

How much did you learn from this project?

- 29% much more than usual
- 43% more than usual
- 13% as much as usual
- 8% less than usual
- 8% somewhat useful
- 3% no response

Rate the overall usefulness of this instruction

- 81% very useful
- 8% useful
- 8% somewhat useful
- 3% no response

“I felt like this project prepared me for my internship”
Improving Data Literacy

The Challenges

- Sources of Good Data
- Access, Manage, and Present Data
- Data Literate
- Subject Matter Experts
- Learning Theory
- Educational Technology

(Photos courtesy of Creative Commons and DeerintheheadlightlookbyCarlaDeterLinkedInProfileWriting)
Improving Data Literacy

Future Goals

• Develop an Educator Tools section for the MAP Dashboard

• Develop a MAP Dashboard Badge Constellation

• Outreach to University faculty and High School teachers