**Quick Facts**

From the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

PKAL Workshop – October 2008

# ASSESSING STATISTICAL LITERACY @ AUGSBURG COLLEGE

# STATISTICAL LITERACY @ AUGSBURG COLLEGE

* Statistical Literacy:
  + Ability to read, write and reason about numbers and statistics in everyday contexts including tables, pie charts, and bar graphs.

* Background:
  + Statistical Literacy for Managers Course
  + Management Information Systems Course

* Methodology:
  + Activity done as a pair for undergraduates ( n = 13 pairs)
  + Activity done as individuals for MBA students (n = 11 students)

* Context:
  + Data Source: 2006 US Census Bureau Survey of Fishing, Hunting and Wildlife Watching.

# READING TABLES OF COUNTS / PERCENTS

## Fishing

### Anglers and Days of Fishing
(In millions)

|  | Anglers | | Days | |
|---|---|---|---|---|
|  | Number | Percent | Number | Percent |
| **Total fishing** . . . . . . | **30.0** | **100** | **517** | **100** |
| Freshwater, total . . . | 25.4 | 85 | 433 | 84 |
| Freshwater, except | | | | |
| Great Lakes . . . . | 25.0 | 84 | 420 | 81 |
| Great Lakes . . . . . | 1.4 | 5 | 18 | 3 |
| Saltwater . . . . . . . . . | 7.7 | 26 | 86 | 17 |

Q:  Write out a statement comparing the number of days spent Freshwater fishing vs. Saltwater fishing.

# ASSESSING STATISTICAL LITERACY

## Fishing

**Anglers and Days of Fishing**
(In millions)

| | Anglers | | Days | |
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| | Number | Percent | Number | Percent |
| Total fishing . . . . . | 30.0 | 100 | 517 | 100 |
| Freshwater, total . . . | 25.4 | 85 | 433 | 84 |
| Freshwater, except | | | | |
| Great Lakes . . . . | 25.0 | 84 | 420 | 81 |
| Great Lakes . . . . . | 1.4 | 5 | 18 | 3 |
| Saltwater . . . . . . . | 7.7 | 26 | 86 | 17 |

**Results:**

Undergrads:  5/13 Incorrect

Statement Types:
Ordinal Comparison = 6
Statement of Facts = 6
Simple Ratio = 1

Q:  Write out a statement comparing the number of days spent Freshwater fishing vs. Saltwater fishing.

In other words:  Compare the number 433 versus 86

## Anglers Pursuing Selected Fish by Type of Fishing
(In millions)

| Fish sought | Number of anglers | Percent |
| --- | --- | --- |
| **Anglers, total** | **30.0** | **100** |
| **Freshwater except Great Lakes** | **25.0** | **83** |
| Black bass | 10.0 | 33 |
| Panfish | 7.5 | 25 |
| Catfish/bullhead | 7.0 | 23 |
| Trout | 6.8 | 23 |
| **Great Lakes** | **1.4** | **5** |
| Walleye, sauger | 0.5 | 2 |
| Perch | 0.5 | 2 |
| Salmon | 0.4 | 1 |
| Lake trout | 0.3 | 1 |
| **Saltwater** | **7.7** | **26** |
| Flatfish (flounder, halibut) | 2.1 | 7 |
| Red drum (redfish) | 1.8 | 6 |
| Sea trout | 1.5 | 5 |
| Striped bass | 1.4 | 5 |

Q: What percentage of Great Lakes anglers fished for perch?

# READING TABLES OF COUNTS / PERCENTS

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| Flatfish (flounder, halibut) | 2.1 | 7 |
| Red drum (redfish) | 1.8 | 6 |
| Sea trout | 1.5 | 5 |
| Striped bass | 1.4 | 5 |

Q: What percentage of Great Lakes anglers fished for perch?

Common Wrong Answer:  2%

Correct Answer:  .5 / 1.4 = 36%

**Results:**

Undergrads: 12/13 Incorrect

MBA's:  10 / 11 Incorrect

# READING TABLES OF COUNTS / PERCENTS

Q:  What % of Great Lakes anglers fished for perch?

**Anglers Pursuing Selected Fish by Type of Fishing**
(In millions)

| Fish sought | Number of anglers | Percent |
|---|---|---|
| Anglers, total . . . . . . . . . . . . | 30.0 | 100 |
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| Saltwater . . . . . . . . . . . . | 7.7 | 26 |
| Flatfish (flounder, halibut) . . . . | 2.1 | 7 |
| Red drum (redfish) . . . . . . | 1.8 | 6 |
| Sea trout . . . . . . . . . . | 1.5 | 5 |
| Striped bass . . . . . . . . . | 1.4 | 5 |

Commonly Wrong Answer:    2%
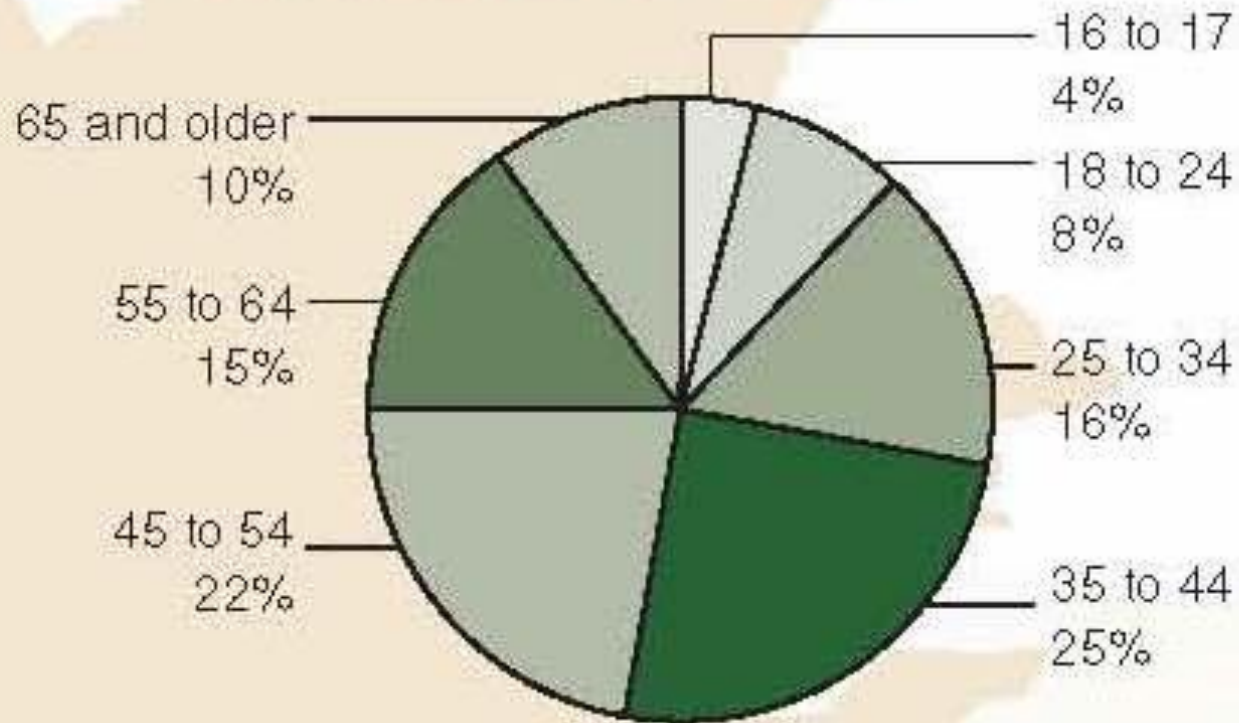
Correct Answer:  .5 / 1.4 = 36%

Two True Statements:

36% of all Great Lakes anglers fish for perch.

2% of all anglers fish the Great Lakes for perch.

# READING / INTERPRETING PIE CHARTS



Percent of Anglers by Age Group

- 16 to 17 — 4%
- 18 to 24 — 8%
- 25 to 34 — 16%
- 35 to 44 — 25%
- 45 to 54 — 22%
- 55 to 64 — 15%
- 65 and older — 10%

Q: What Percentage of Anglers are less than age 35?

Q: What Percentage of Anglers are between 35 and 54?

# READING / INTERPRETING PIE CHARTS

Q: What Percentage of Anglers are less than age 35?

**Results:**
Answer: 28%

Undergrads: 0 / 13 Incorrect

MBA's: 1 / 11 Incorrect

Q: What Percentage of Anglers are between 35 & 54?

**Results:**
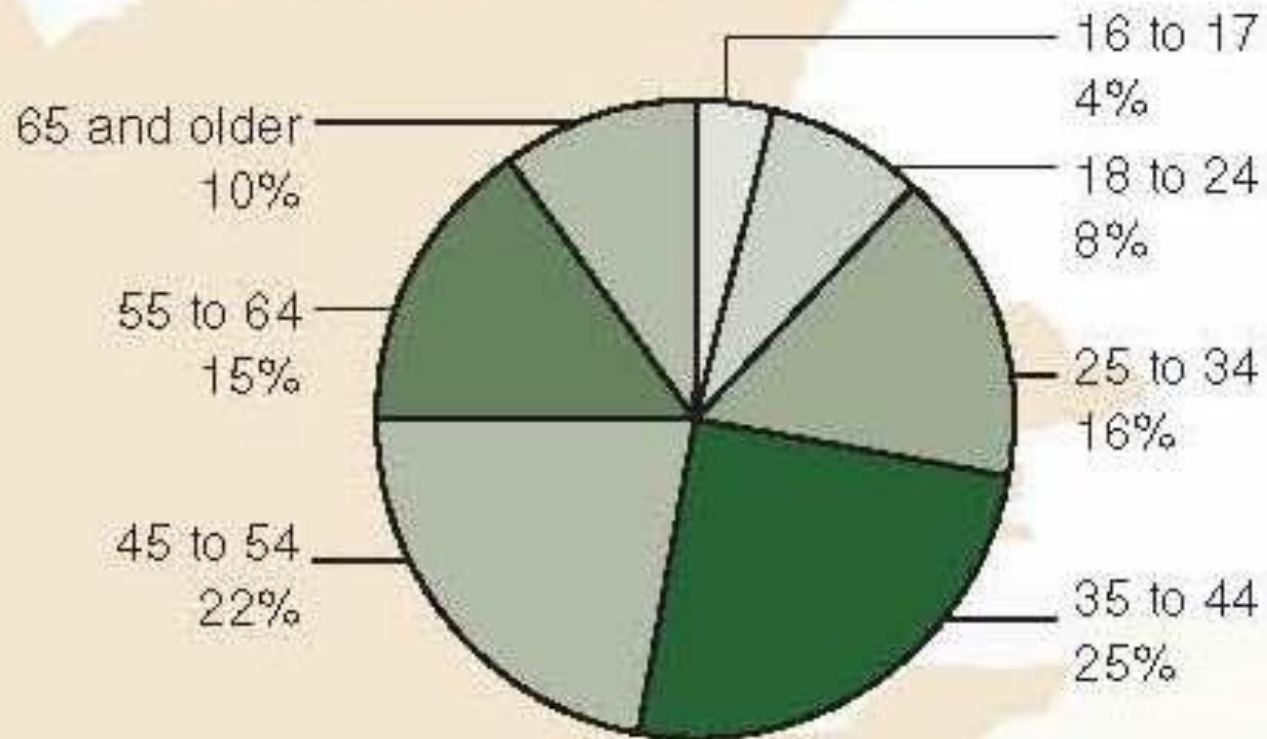Answer: 47%

Undergrads: 0 / 13 Incorrect

MBA's: 1 / 11 Incorrect

Percent of Anglers by Age Group

16 to 17
4%

18 to 24
8%

25 to 34
16%

35 to 44
25%

45 to 54
22%

55 to 64
15%

65 and older
10%

Percent of Anglers by Age Group

16 to 17 — 4%
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25 to 34 — 16%
35 to 44 — 25%
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65 and older — 10%

Q: What percentage of 18 to 24 year olds are anglers?

# ASSESSING STATISTICAL LITERACY

Q: What percentage of 18 to 24 year olds are anglers?

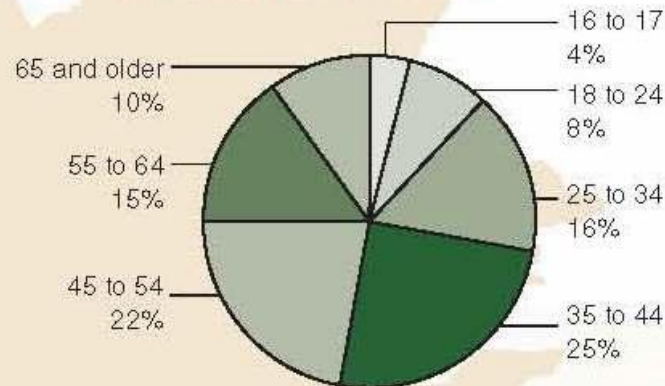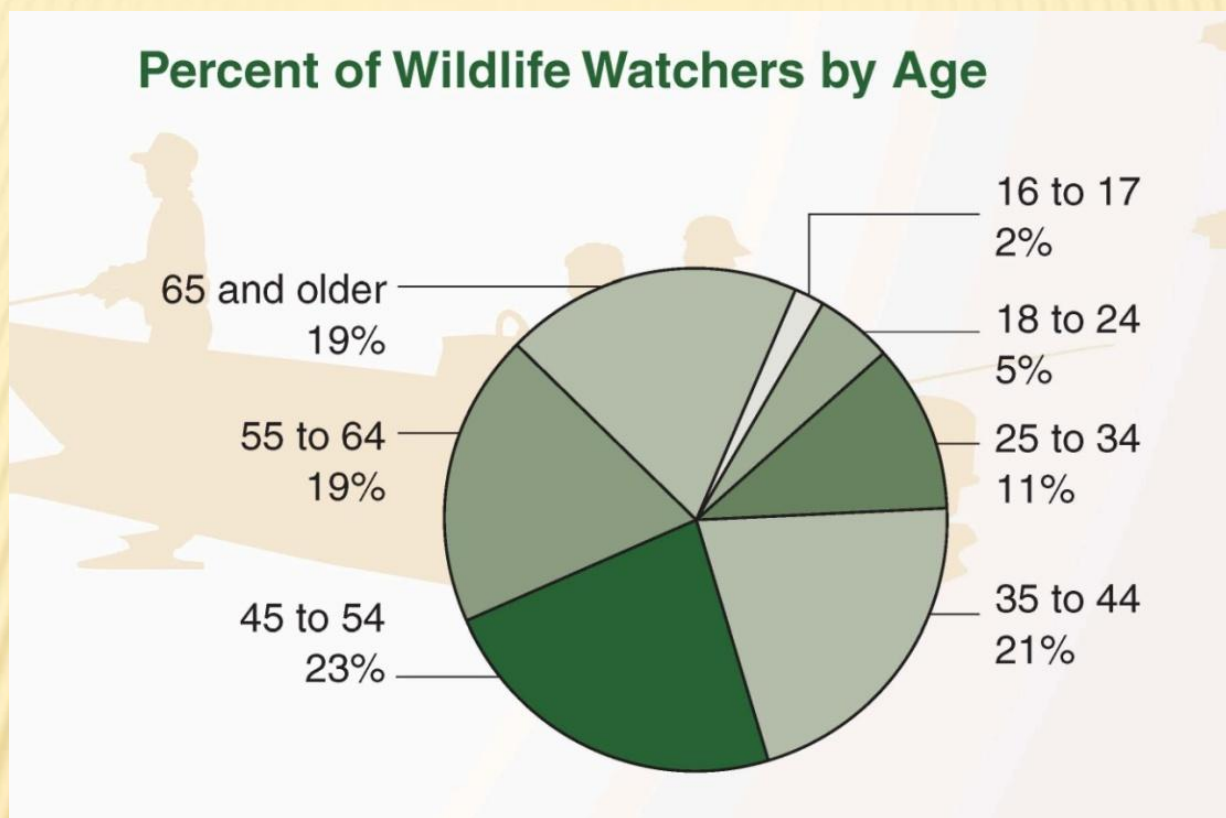Results:

Answer: Can't Tell

Undergrads: 10/13 Incorrect

MBA's: 6 / 11 Incorrect

**Percent of Anglers by Age Group**

- 16 to 17: 4%
- 18 to 24: 8%
- 25 to 34: 16%
- 35 to 44: 25%
- 45 to 54: 22%
- 55 to 64: 15%
- 65 and older: 10%

# READING / INTERPRETING PIE CHARTS



Percent of Wildlife Watchers by Age

- 65 and older 19%
- 55 to 64 19%
- 45 to 54 23%
- 16 to 17 2%
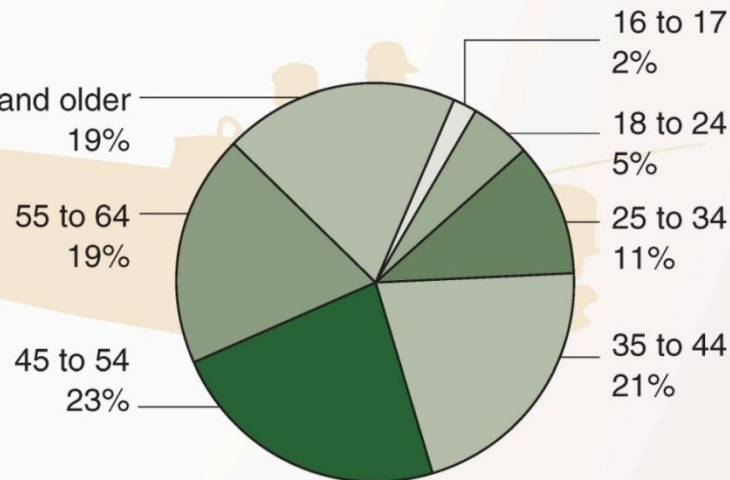- 18 to 24 5%
- 25 to 34 11%
- 35 to 44 21%

Q: What is the definition of a wildlife watcher in this pie chart?

Q: What percentage of 35 to 44 year olds are wildlife watchers?

Q: What percentage of wildlife watchers are between 35 & 44 yrs of age?

# READING / INTERPRETING PIE CHARTS

**Percent of Wildlife Watchers by Age**



| Age | Percent |
|---|---|
| 16 to 17 | 2% |
| 18 to 24 | 5% |
| 25 to 34 | 11% |
| 35 to 44 | 21% |
| 45 to 54 | 23% |
| 55 to 64 | 19% |
| 65 and older | 19% |

Q: What is the definition of a wildlife watcher in this pie chart?

Correct Answer: Can't Tell

Q: What % of 35 to 44 year olds are wildlife watchers?

**Results:**
Answer: Can't Tell
Undergrads: 6 / 13 Incorrect
MBA's: 6 / 11 Incorrect

Q: What % of wildlife watchers are between 35 & 44 yrs of age?

**Results:**
Answer: 21%
Undergrads: 5 / 13 Incorrect
MBA's: 3 / 11 Incorrect

# READING / INTERPRETING BAR CHARTS



Percent of U.S. Population Who Wildlife Watched by Household Income

| Household Income | Percent |
|---|---|
| Less than $20,000 | 23% |
| $20,000 to $34,999 | 27% |
| $35,000 to $49,999 | 36% |
| $50,000 to $74,999 | 40% |
| $75,000 to $99,999 | 40% |
| $100,000 or more | 43% |

Q:  What percentage of low income (<$20k) households are wildlife watchers?

Q:  What percentage of those under $35k households are wildlife watchers?

# READING / INTERPRETING BAR CHARTS

## Percent of U.S. Population Who Wildlife Watched by Household Income

| Household Income | Percent |
|---|---|
| Less than $20,000 | 23% |
| $20,000 to $34,999 | 27% |
| $35,000 to $49,999 | 36% |
| $50,000 to $74,999 | 40% |
| $75,000 to $99,999 | 40% |
| $100,000 or more | 43% |

Q: What percentage of low income (<$20k) households are wildlife watchers?

**Results:**
Answer: 23%
Undergrads: 0 / 12 Incorrect
MBA's: 2 / 11 Incorrect

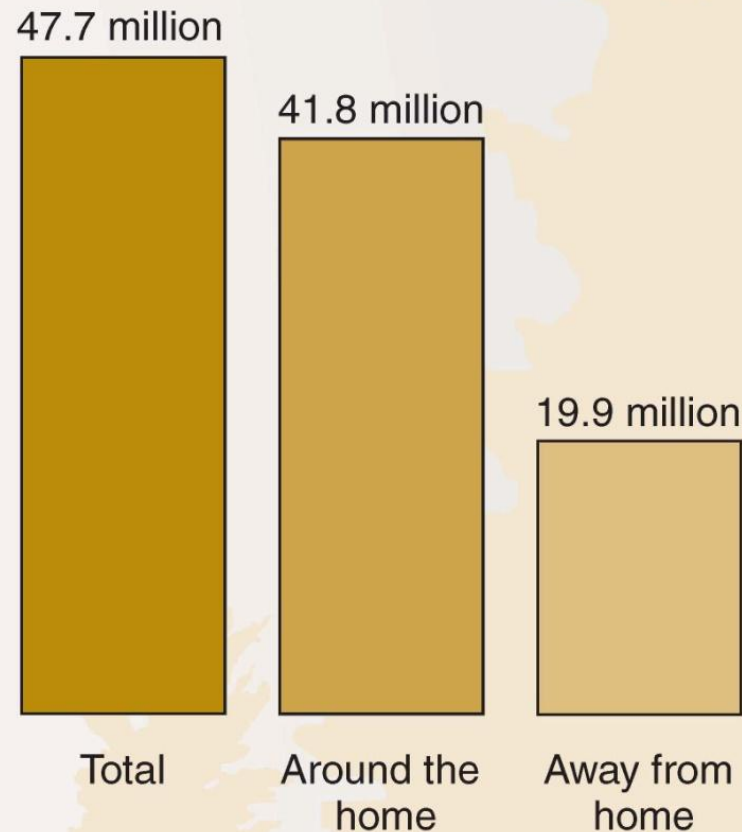Q: What percentage of those under $35k households are wildlife watchers?

**Results:**
Answer: Can't Tell
Undergrads: 8 / 13 Incorrect
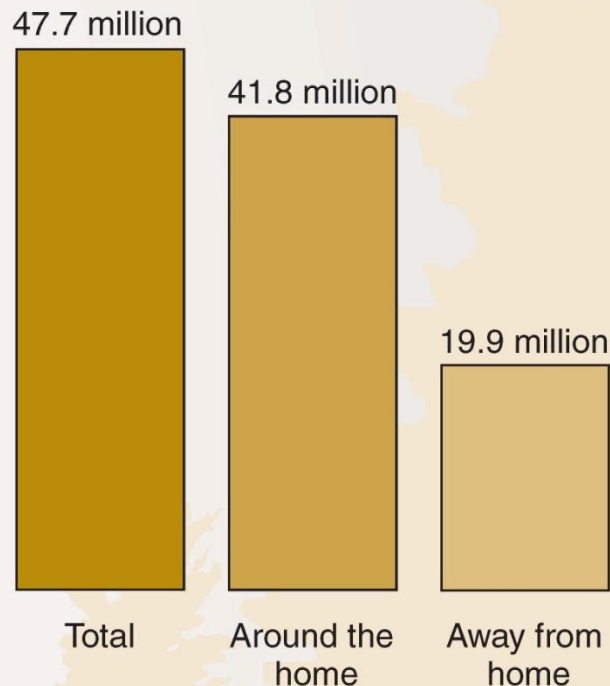MBA's: 5 / 11 Incorrect

# READING / INTERPRETING BAR CHARTS



**Bird Watchers**

- 47.7 million — Total
- 41.8 million — Around the home
- 19.9 million — Away from home

Q: How many bird watchers participate in that activity <u>both</u> around the home and away from home?

# READING / INTERPRETING BAR CHARTS

**Bird Watchers**

47.7 million

41.8 million

19.9 million

Total | Around the home | Away from home

Q: How many bird watchers participate in that activity _both_ around the home and away from home?

**Results:**

Answer: 14 million

Undergrads:    13  / 13 Incorrect
MBA's:  7 / 11 Incorrect

# CONCLUSIONS / DISCUSSION

- ✖ This is not rocket science!
  - ✚ Reading Tables, Pie Charts and Bar Graphs
  - ✚ Writing Statements including #'s
  - ✚ Interpreting Summary Data

- ✖ Test it out with your students!
  - ✚ Link to Census Brochure:
    - ✖ www.census.gov/prod/2008pubs/fhw06-qkfact.pdf
  - ✚ Link to 10 item sample survey:
    - ✖ www.StatLit.org/pdf/2008IsaacsonQuestionsPKAL.pdf

  - ✚ Questions / Comments?

  - ✚ Email address: isaacson@augsburg.edu