GLOBAL STATISTICS	**Student Goals** Statistics are important for students to use appropriately and understand how to calculate the concepts of mean, median, mode and range when preparing for the GED test.
Outcome (*lesson objective*) Students will select appropriate data to determine the mean, median, mode and range of a set of data.	**Time Frame** 2-3 hours
Standard *Use Math to Solve Problems and Communicate*	**NRS EFL 3-6**

Number Sense	Benchmarks	Geometry & Measurement	Benchmarks	Processes	Benchmarks
Words to numbers connection		Geometric figures		Word problems	3.21, 4.25, 5.25, 6.26
Calculation	3.2, 4.2, 5.1, 6.1	Coordinate system		Problem solving strategies	
Order of operations		Perimeter/area/volume formulas		Solutions analysis	4.27, 5.27, 6.28
Compare/order numbers		Graphing two-dimensional figures		Calculator	3.22, 4.28, 5.28, 6.29
Estimation		Measurement relationships		Mathematical terminology/symbols	
Exponents/radical expressions		Pythagorean theorem		Logical progression	
Algebra & Patterns	**Benchmarks**	Measurement applications		Contextual situations	4.31, 5.31, 6.32
Patterns/sequences		Measurement conversions		Mathematical material	
Equations/expressions		Rounding		Logical terms	
Linear/nonlinear representations		**Data Analysis & Probability**	**Benchmarks**	Accuracy/precision	3.26, 4.33, 5.34, 6.35
Graphing		Data interpretation	3.16, 4.20, 5.20	Real-life applications	3.27, 4.34, 5.35, 6.36
Linear equations		Data displays construction		Independence/range/fluency	3.28, 4.35, 5.36
Quadratic equations		Central tendency	3.18, 4.22, 5.22, 6.23		
		Probabilities			
		Contextual probability			

Materials
World/Country Data Handout
calculators, graph paper
world maps - optional

Learner Prior Knowledge
Basic knowledge of using a calculator and knowledge of the concepts of mean, median, mode and range.

Instructional Activities
Step 1 - Teacher will distribute *World/Country Data* Handout. Discuss the meaning of each type of data on the handout (**region**, **area**, **population**, **life expectancy**, and **literacy rate**). Next review/introduce the group to the meaning of the statistical terms necessary for the lesson: **mean** (average) [is the sum of the numbers (data) divided by the number of numbers in the set], **median** [value closest to the middle of the numbers in a set], **mode** [the number that occurs most often in the set. If no number occurs more often than any other, there is no mode] and **range** [the difference between the greatest and least values. The range is a measure of the spread of data values].

TEACHER NOTE All of these concepts should be introduced by first questioning students about their current knowledge. Expand their ideas to include a formal definition and equation where appropriate.
Pass out index cards for students to record math vocabulary and definitions/equations/notes.

Step 2 - Select a geographic region (e.g., "Pacific Islands") and model for the students how to calculate the mean, median, mode and range of the data set (literacy rates in countries in the Pacific Island region). Ask students to help locate the appropriate data in the

table and to help calculate each statistic. Allow for questions during and after the examples to insure student understanding.

Step 3 – Divide students into pairs and assign each group a geographic region. More than 1 pair can be assigned to a region. Each pair of students will use the data set for their region to calculate the mean, median, mode and range of the literacy rate.

TEACHER NOTE Calculators should be available for use during this lesson. If possible, have world maps available so students can look up the location of the countries in their regions of the world.

Step 4 - Next, students will share their data with the other groups so all pairs will have all data. Pairs assigned the same region should compare answers to check for accuracy. Before sharing data, discuss with students how they could determine the number of columns and rows necessary for a chart containing all the data. The students will construct a chart to record the data from all pairs on each region. Students will compare the values for each statistical representation (mean, median, mode and range) and discuss with their partners the possible reasons for differences in the data results. Each pair of students will evaluate the statistical representations and decide which statistic best reflects the data and why they think so.

Step 5 - Students will use the statistical representation they feel best reflects the data to construct a graph to compare the literacy rates between the regions. Students will write a paragraph explaining the rationale of their choice of representation. The students will also hypothesize about the results for particular regions.

Step 6 - As a culminating activity to document competency, the students will work alone to calculate the mean, median, mode and range for **life expectancy** in a world region. Students will share their data with their classmates and construct a chart of the data. Finally each student will graph the results of the data in all regions for one statistical representation (i.e., mean, median, or mode). Finally, each student will write a paragraph explaining his or her results.

SOCIAL STUDIES EXTENSION Students can look for current events articles for the countries in the various regions of the world. If possible provide maps so students can locate the countries in their region.

Assessment/Evidence (*based on outcome*)
Charts listing statistical data on world regions
Graph comparing literacy rates
Paragraphs explaining the graphs and the results
Final Assessment: Chart, Graph and Paragraph on World Life Expectancies

Teacher Reflection/Lesson Evaluation
The data on the countries of the world found in the handout provides lots of practice in data analysis. Most students will find it enlightening to see the number of countries in the world.

Next Steps
Students could use the data on the countries to determine the population density of each country. The data could be used to rank the countries in order. Life expectancy and literacy rate of the countries in a region could be plotted to locate where the data clusters occur.

Technology Integration

Purposeful/Transparent
The student will gain practice calculating mean, median, mode and range and an understanding of the pros and cons of each statistic.

Contextual
The lesson uses data on countries of the world from various regions that we read about in the news regularly. Life expectancies and literacy rates are relevant statistics in today's world.

Building Expertise
This exercise builds on a student's basic knowledge of average.

World/Country Data Handout

Country	Region	Area (sq. miles)	Population	Life Expectancy	Literacy Rate
Afghanistan	Asia	251,737	29,928,987	42.5	36%
Albania	Europe	11,100	3,563,112	77.1	87%
Algeria	Africa	919,590	32,531,853	72.7	70%
Andorra	Europe	181	70,549	83.5	100%
Angola	Africa	481,350	11,190,786	36.8	42%
Antigua &Barbuda	North America	171	68,722	71.6	89%
Argentina	South America	1,068,296	39,537,943	75.7	96%
Armenia	Asia	11,500	2,982,904	71.2	99%
Australia	Pacific Islands	2,967,893	20,090,437	80.3	100%
Austria	Europe	32,375	8,184,691	78.9	98%
Azerbaijan	Asia	33,400	7,911,974	63.2	97%
Bahamas	North America	5,380	301,790	65.6	96%
Bahrain	Asia	257	688,345	74	89%
Bangladesh	Asia	55,598	144,319,628	61.7	43%
Barbados	North America	166	279,254	71.6	97%
Belarus	Europe	80,154	10,300,483	68.6	100%
Belgium	Europe	11,781	10,364,388	78.4	98%
Belice	Central America	8,865	279,457	67.4	94%
Benin	Africa	43,483	7,460,025	50.8	41%
Bhutan	Asia	18,147	2,232,291	54	42%
Bolivia	South America	424,162	8,857,870	65.1	87%
Bosnia	Europe	19,741	4,025,476	72.6	NA
Botswana	Africa	231,800	1,640,115	34.2	80%
Brazil	South America	3,286,470	186,112,794	71.4	86%
Brunei	Asia	2,228	372,361	74.5	92%
Bulgaria	Europe	48,822	7,450,349	71.8	99%
Burkina Faso	Africa	1005,870	13,925,313	44.2	27%
Burundi	Africa	10,745	6,370,609	43.4	52%
Cambodia	Asia	69,900	13,907,069	58.4	70%
Cameroon	Africa	183,567	16,380,005	48	79%
Canada	North America	3,851,788	32,805,041	80	97%
Cape Verde	Africa	1,557	418,224	70.1	77%
Central African Republic	Africa	240,534	3,799,897	41.4	51%
Chad	Africa	495,752	9,826,419	48.2	48%

Country	Region	Area(sq. miles)	Population	Life Expectancy	Literacy Rate
Chile	South America	292,258	15,980,912	76.4	96%
China	Asia	3,705,386	1,306,313,812	72	86%
Columbia	South America	439,733	42,954,279	71.4	93%
Comoros	Africa	838	671,247	61.6	57%
Congo	Africa	905,562	60,085,004	49.1	66%
Costa Rica	Central America	19,730	4,016,173	76.6	96%
Côte d'Ivoire	Africa	124,502	17,298,040	48.4	51%
Croatia	Europe	21,829	4,495,904	74.1	99%
Cuba	North America	42,803	11,346,670	77	97%
Cyprus	Middle East	3,572	780,133	77.5	98%
Czech Republic	Europe	30,450	10,241,138	75.8	100%
Denmark	Europe	16,639	5,432,335	77.4	100%
Djibouti	Africa	8,800	476,703	43.1	68%
Dominica	North America	290	69,029	74.4	94%
Dominican Republic	North America	18,815	8,950,034	67.6	85%
East Timor	Asia	290	69,029	74.4	94%
Ecuador	South America	109,483	8,950,034	76	93%
Germany	Europe	137,846	82,431,390	78.5	99%
Ghana	Africa	92,456	21,029,853	56.3	75%
Greece	Europe	50,942	10,668,354	78.5	98%
Grenada	North America	133	89,502	64.5	90%
Guatemala	Central America	42,042	14,655,189	65.2	71%
Guinea	Africa	94,925	9,467,866	49.7	36%
Guinea-Bissau	Africa	13,946	1,416,027	47	42%
Guyana	South America	83,000	765,283	65.1	99%
Haiti	North America	10,714	8,121,622	52.6	53%
Honduras	Central America	43,278	6,975,204	66.2	76%
Hungary	Europe	35,919	10,006,835	72.2	99%
Iceland	Europe	39,768	296,737	80.2	100%
India	Asia	1,269,338	1,080,264,388	64	60%
Indonesia	Asia	741,096	241,973,879	69.3	89%
Iran	Middle East	636,293	68,017,860	69.7	79%
Iraq	Middle East	168,753	26,074,906	68.3	40%
Ireland	Europe	27,136	4,015,676	77.4	98%
Israel	Middle East	8,020	6,276,883	79.2	95%
Italy	Europe	116,305	58,103,033	79.5	99%

Country	Region	Area(sq. miles)	Population	Life Expectancy	Literacy Rate
Jamaica	North America	4,244	2,731,832	76.1	88%
Japan	Asia	145,882	58,103,033	79.5	99%
Jordan	Middle East	34,445	5,759,732	78.1	91%
Kazakhstan	Asia	1,049,150	15,185,844	66.1	98%
Kenya	Africa	224,960	33,829,590	47.2	85%
Kiribati	Pacific Islands	313	103,092	61.3	NA
Korea, North	Asia	46,540	22,912,177	71.1	99%
Korea, South	Asia	38,023	48,422,644	75.6	98%
Kuwait	Middle East	6,880	2,335,648	76.8	84%
Kyrgyzstan	Asia	76,641	5,146,281	67.8	97%
Laos	Asia	91,429	6,217,141	54.7	53%
Latvia	Europe	24,938	2,290,237	70.9	100%
Lebanon	Middle East	4,015	3,826,018	72.3	87%
Lesotho	Africa	11,720	1,867,035	36.8	85%
Liberia	Africa	43,000	3,482,211	47.9	58%
Libya	Africa	679,358	5,765,563	76.3	83%
Liechtenstein	Europe	62	33,717	79.4	100%
Lithuania	Europe	25,174	3,596,617	73.5	100%
Luxembourg	Europe	999	468,571	78.6	100%
Macedonia	Europe	9,781	2,045,262	73.5	NA
Madagascar	Africa	226,660	18,040,341	56.5	69%
Malawi	Africa	45,745	12,158,924	37.5	63%
Malaysia	Asia	127,316	23,953,136	72	89%
Maldives	Asia	116	349,106	63.7	97%
Mali	Africa	478,764	12,291,529	45.3	46%
Malta	Europe	122	398,534	78.7	93%
Marshall Islands	Pacific Islands	70	59,071	69.7	94%
Mauritania	Africa	397,953	3,086,859	52.3	42%
Mauritius	Africa	788	1,230,602	72.1	86%
Mexico	North America	761,600	106,202,903	74.9	92%
Micronesia	Pacific Islands	271	108,105	69.4	89%
Moldova	Europe	13,067	4,455,421	65	99%
Monaco	Europe	0.75	32,409	79.4	99%
Mongolia	Asia	604,250	2,791,272	64.2	99%
Morocco	Africa	172,413	32,725,847	70.3	52%
Mozambique	Africa	309,494	19,406,703	40.9	48%
Myanmar(Burma)	Asia	261,969	42,909,464	56	83%

Country	Region	Area(sq. miles)	Population	Life Expectancy	Literacy Rate
Namibia	Africa	318,694	2,030,692	44.8	84%
Nauru	Pacific Islands	8.2	13,048	62.3	NA
Nepal	Asia	54,363	27,676,547	59.4	45%
The Netherlands	Europe	16,036	16,407,491	78.7	99%
New Zealand	Pacific Islands	103,737	4,035,461	78.5	99%
Nicaragua	Central America	49,998	5,465,100	70	68%
Niger	Africa	489,189	11,665,937	42.2	18%
Nigeria	Africa	356,700	128,771,988	46.5	68%
Norway	Europe	125,181	4,593,041	79.2	100%
Oman	Middle East	82,030	3,001,583	72.8	76%
Pakistan	Asia	310,400	162,419,946	62.6	46%
Palau	Pacific Islands	177	20,303	69.8	92%
Panama	Central America	30,193	3,039,150	72.1	93%
Papua New Guinea	Pacific Islands	178,703	5,545,268	64.6	66%
Paraguay	South America	157,046	6,347,884	74.6	94%
Peru	South America	496,223	27,925,628	69.2	91%
The Philippines	Asia	115,830	87,857,473	69.6	96%
Poland	Europe	120,727	38,635,144	74.2	100%
Portugal	Europe	35,672	10,566,212	77.3	93%
Qatar	Middle East	4,416	863,051	73.4	83%
Romania	Europe	91,700	22,329,977	71.1	98%
Russia	Europe & Asia	6,592,735	143,420,309	66.8	100%
Rwanda	Africa	10,169	8,440,820	46.6	70%
Saint Kitts & Nevis	North America	101	38,958	71.9	97%
Saint Lucia	North America	239	166,312	73.3	67%
Saint Vincent&Grenadines	North America	150	117,534	73.3	96%
Samoa	Pacific Islands	1,104	177,287	70.4	100%
San Marino	Europe	24	28,880	81.5	96%
São Tomé	Africa	386	187,410	66.6	79%
Saudi Arabia	Middle East	756,981	26,417,599	75.2	79%
Senegal	Africa	75,749	11,126,832	56.6	40%
Serbia & Montenegro	Europe	39,517	10,829,175	74.4	93%
Syeychelles	Africa	176	81,188	71.5	58%
Sierra Leone	Africa	27,699	6,017,643	42.7	31%
Singapore	Asia	267	4,425,720	81.5	93%
Slovakia	Europe	18,859	5,431,363	74.2	NA
Slovenia	Europe	7,820	2,011,070	75.9	100%

Country	Region	Area(sq. miles)	Population	Life Expectancy	Literacy Rate
Solomon Islands	Pacific Islands	10,985	538,032	72.4	NA
Somalia	Africa	246,199	8,591,629	47.7	38%
South Africa	Africa	471,008	44,344,136	44.1	86%
Spain	Europe	194,896	40,341,462	79.4	98%
Sri Lanka	Asia	25,332	20,064,776	72.9	92%
Sudan	Africa	967,493	40,187,486	58.1	61%
Suriname	South America	63,039	438,144	69.1	93%
Swaziland	Africa	6,704	1,173,900	37.5	82%
Sweden	Europe	173,731	9,001,774	80.3	99%
Switzerland	Europe	15,942	7,489,370	80.3	99%
Syria	Middle East	71,498	18,448,752	69.7	77%
Taiwan	Asia	13,892	22,894,384	77.1	86%
Tajikistan	Asia	55,251	7,163,506	64.5	99%
Tanzania	Africa	364,898	36,766,356	44.9	78%
Thailand	Asia	198,455	65,444,371	71.4	96%
Togo	Africa	21,925	5,681,519	53	61%
Tonga	Pacific Islands	290	112,422	69.2	99%
Trinidad & Tobago	North America	1,980	1,088,644	69.3	99%
Tunisia	Africa	63,170	10,074,951	74.7	74%
Turkey	Europe and Asia	301,388	69,660,559	72.1	87%
Turkmenistan	Asia	188,455	4,952,081	61.3	98%
Tuvalu	Pacific Islands	10	11,636	67.7	NA
Uganda	Africa	91,135	27,269,482	50.4	70%
Ukraine	Europe	233,089	47,425,336	66.7	100%
United Arab Emirates	Middle East	32,000	2,563,212	75	78%
United Kingdom	Europe	94,525	60,441,457	78.3	99%
Uruguay	South America	68,040	3,415,920	75.9	98%
Uzbekistan	Asia	172,741	26,851,195	64.1	99%
Vanuatu	Pacific Islands	5,700	205,754	62.1	53%
Vatican City	Europe	0.17	890	NA	100%
Venezuela	South America	352,143	25,375,281	74.1	93%
Vietnam	Asia	127,243	83,535,576	70.4	94%
Yemen	Middle East	203,850	20,727,063	61.4	50%
Zambia	Africa	290,584	11,261,795	39.4	81%
Zimbabwe	Africa	150,803	12,746,990	37.8	91%