

Equity and Inclusion: Through the Lens of the Catholic Social Teachings

ECONOMIC JUSTICE

“Give to the one who asks of you, and do not turn your back on one who wants to borrow.” Matt. 5:42

Economic Justice is the equitable distribution of wealth – sufficient to enable all human persons to live a life of dignity and community. Economic Justice must provide for responsible stewardship of natural resources. The prevailing economic system of our time, capitalism, is based on the legal right of private property. Economic Justice demands that the rights of the commons be balanced with and not usurped by the rights of private ownership and the profit motive. No profit is justifiable if it is derived from economic activity that consistently places private interests ahead of the common good. Economic Justice demands that labour which is derived directly from the human person; is pre-eminent in relation to all economic inputs and must be valued accordingly. All workers have a right to productive work, decent and fair wages, safe working conditions; and the right to organize and form unions.

Sample Lessons Using the Economic Justice Framework

Grade, Subject, Code Lesson Topic	Lesson Summary
Grade 10 Introduction to Business BBI20 SWOT Equity in the Common Good	Through this assignment students will consider how Economic Justice can be served. Students will carry out a traditional SWOT analysis of a publicly traded company on the Toronto Stock Exchange; making a special effort to research and incorporate company policies and practices dealing with equity and inclusion. SWOT analysis is a useful management tool for auditing an organization and its environment.
Grade 10 Mathematics MPM2P Is income fairly distributed amongst countries of the world?	The analysis will lead to discussions about Economic Justice. This lesson will allow students to apply their understanding of quadratic and linear relations in order to analyze income data from the 20 th century for pairs of countries.

NOTE: These lessons are provided as cross-curricular examples of how our Catholic Social Teachings can guide our teaching and bring the lens of faith to Equity and Inclusion in our classroom. These exemplars are only a beginning. The framework can be used by teachers to develop lessons of their own by selecting guiding questions with their students while addressing and assessing other curriculum expectations.

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Guiding Questions: Economic Justice

*“With her social doctrine the Church proclaims God and the mystery of salvation in Christ to every human being”
(Compendium of Social Doctrine 67)*

The Catholic Social Teachings

- Given the right choices made by human persons, how is Economic Justice achievable?
- How might capitalism be sustainable and/or consistent with Catholic values?
- Consider balance: How much is enough? How much is too much?
- How can people employ the principles of Economic Justice in their business or life? Do we recognize that these internal motivating factors which lead to success are gifts from God (e.g. initiative, creativity, opportunism, organizational skills)?
- When we see injustices that are derived from improper economic activity – to what extent are we obligated as Catholics to respond, challenge, protest, and change?

The Equity and Inclusive Education Strategy

- How do we make everyone in our classroom feel respected, safe, and included to provide the best opportunity for growth and student achievement?
- What gifts do you bring to share with your classmates and how will you use these gifts to support your learning and the learning of others?
- How can we recognize and value the gifts of others?
- How do you see yourself as a valued and contributing member of this class, school, community, and society?
- In building a welcoming learning environment, what words and actions demonstrate respect for the dignity of all?

ECONOMIC JUSTICE

Critical Literacy

- What kinds of issues of equity, power and social justice are relevant to the topic?
- How can we analyze the information presented for bias, reliability, fairness, and validity?
- How can we challenge our assumptions?
- What types of actions and/or responses are appropriate in the subject?
- How does our faith (age, culture, life experiences, values, etc.) influence how the message is interpreted?
- How might the text be changed to offer alternative perspectives or recognize and include missing voices, such as the marginalized?

The Ontario Catholic Graduate Expectations

- What scriptural reference might guide our thinking in this Catholic Social Teaching?
- How does the Catholic Social Teaching, Economic Justice call us to respond or act:
 - As a discerning believer?
 - As an effective communicator?
 - As a reflective, creative, holistic thinker?
 - As a self-directed responsible life-long learner?
 - As a collaborative contributor?
 - As a caring family member?
 - As a responsible citizen?

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GRADE 10

**Equity and Inclusive
Education:
From the Lens of the
Catholic Social Teachings**

Subject: Introduction to Business

Code: BBI20

Lesson Title: SWOT Equity in the Commons

Suggested length of time: introductory lesson is 75 minutes with follow-up time to complete assigned tasks

Lesson Overview:

SWOT analysis is a useful management tool for auditing an organization and its environment; and focusing on key issues. SWOT stands for strengths, weaknesses, opportunities, and threats. Students will carry out a traditional SWOT analysis of a publicly traded company on the Toronto Stock Exchange, making a special effort to research and incorporate company policies and practices dealing with equity and inclusion.

Students will then extend their range of thinking to analyze and judge the practices of the company in the context of investments in the Common Good – special initiatives (tangible and measurable) under-taken by the company leading to redistribution of income, community investment, charitable initiatives, etc. This extension is: **SWOT Equity in the Commons.**

Through this assignment students will consider how Economic Justice can be served; when companies focus on equity and inclusion; as well as redirect financial/other resources towards the Common Good, the social and economic impact of these investments can be both substantial and significant.

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CURRICULUM CONNECTIONS	CATHOLIC SOCIAL TEACHINGS & ONTARIO CATHOLIC SCHOOL GRADUATE EXPECTATIONS
<p>Introduction to Business BBI20</p> <p>Strands: A. Business Fundamentals B. Functions of a Business</p> <p>Overall Expectations: By the end of this course, students will: A3. demonstrate an understanding of ethics and social responsibility in business; B3. demonstrate an understanding of sound management practices in business</p> <p>Specific Expectations: A3.1 explain the concepts of ethics and social responsibility as they apply to business (e.g., workplace safety, antidiscrimination issues, accessibility issues for people with disabilities, environmental responsibility, respect for labour laws, fair trade); A3.2 describe the impact of business on the local community; A3.4 explain controversial business issues from a local, national, and international perspective (e.g., accounting scandals, environmental impact of some business practices, insider trading, fraud); B3.1 describe the role of management in business; B3.3 explain the importance of ethical behaviour with respect to employees, the environment and communities.</p>	<p>The Catholic Social Teaching(s) evident in this lesson: Economic Justice, as well as Common Good and Community</p> <p>The prevailing economic system of our time, capitalism, is based on the legal right of private property. Economic Justice demands that the rights of the commons be balanced with and not usurped by the rights of private ownership and the profit motive. Although Economic Justice is the focal point, the key concept of the Common Good and Community is a natural link.</p> <p>As members of the community we are called to promote the Common Good. The Common Good requires us to ensure that the goods of the earth are to be enjoyed by all so that each person can respond to God’s call, reach their full potential, and contribute to the life in society.</p> <p>The Ontario Catholic School Graduate Expectations evident in this lesson include:</p> <p>A Discerning Believer Formed in the Catholic Faith Community who: 1(d) develops attitudes and values founded on Social Teaching and acts to promote social responsibility, human solidarity and the Common Good;</p> <p>An Effective Communicator who 2 (e) uses and integrates the Catholic faith tradition, in the critical analysis of the arts, media, technology and information systems to enhance the quality of life.</p> <p>A Reflective and Creative Thinker who</p>

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	<p>3(b) creates, adapts, and evaluates new ideas in light of the Common Good; 3(e) adopts a holistic approach to life by integrating learning from various subject areas and experience;</p> <p>A Collaborative Contributor who 5(d) finds meaning, dignity, fulfillment and vocation in work which contributes to the Common Good.</p>
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Guiding Questions from the Framework
<p>These guiding questions have been selected from the framework focusing on:</p> <p>Equity and Inclusive Education:</p> <ul style="list-style-type: none">• How can we recognize the gifts of others and value them?• How do you see yourself as a valued and contributing member of this class, school, community, and society? <p>Catholic Social Teaching:</p> <ul style="list-style-type: none">• Given the right choices made by human persons, how is Economic Justice achievable?• How can people employ the principles of Economic Justice in their business or life? <p>Ontario Catholic Graduate Expectations: How does the Catholic Social Teaching, Economic Justice, call us to respond or act:</p> <ul style="list-style-type: none">• As an effective communicator• As a reflective, creative, holistic thinker• As a collaborative contributor• As a responsible citizen <p>Critical Literacy:</p> <ul style="list-style-type: none">• What kinds of issues of equity, power and social justice are relevant to the topic?• What types of actions and/or responses are appropriate in the subject? <p>Teachers and students may select additional questions from the framework to guide their learning inquiry.</p>

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LEARNING GOALS
<p>At the end of this lesson, students will know, understand and/or be able to:</p> <ul style="list-style-type: none"> • Identify, evaluate, and analyze the strengths, weaknesses, opportunities, and threats associated with a company whose shares are traded publicly on the Toronto Stock Exchange; • Develop a broader understanding of how corporations go about the business of solving business problems, developing opportunities, growing and evolving to remain profitable and relevant, developing and implementing strategies, etc; • Develop a basic sense of how to make wise and ethical investments in a publicly traded company (or potentially other types of business entities) that considers both traditional management issues, as well as other tangibles/intangibles that reflect its internal culture and response to the Common Good; • Begin to build a basic moral and ethical foundation that will help guide them in making future business decisions and investments.

INSTRUCTIONAL COMPONENTS AND CONTEXT	
<p>Prior Learning</p> <p>This activity could be assigned after students complete the Business Fundamentals unit; however, it could also be scaled into a more challenging activity if assigned after students acquire a broader foundation of learning by completing the Functions of a Business, and Finance units.</p> <p>Teacher Readiness:</p> <p>Prior to this lesson, teacher would have completed the Business Fundamentals Unit; and introduced students to the basics of how company stocks/shares are traded on the Toronto Stock Exchange; as well as the purpose of and how to read Annual Reports.</p> <p>The teacher will also draw students' attention to meaningful sections of the Annual Report such as:</p>	<p>Materials:</p> <p>Appendix A SWOT Analysis Template Appendix B Teacher Notes: : SWOT Equity in the Commons Appendix C Descriptors: SWOT Equity in the Commons Appendix D Corporate Examples: SWOT Equity in the Commons Appendix E Assignment Outline: SWOT Equity in the Commons Appendix F Rubric: SWOT Equity in the Commons</p> <p>Internet Resources:</p> <p>http://www.tmx.com/en/index.html</p> <p>http://www.investopedia.com/terms/s/swot.asp</p> <p>http://en.wikipedia.org/wiki/SWOT_analysis</p> <p>http://www.ge.com/ar2003/tools_guide.jsp</p> <p>http://www.ge.com/ar2003/citizenship/index.jsp</p>

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<ul style="list-style-type: none">• management’s explanation of events affecting the company’s performance• expectations for coming year• core businesses and strategy• key performance drivers• capabilities (capital and other) to deliver results• results – historical/expected• risks that may affect results <p>Student Readiness:</p> <p>Prior to this lesson, students will have explored the Internet resources; and considered potential companies for their SWOT analysis assignment.</p> <p>Terminology</p> <p>Annual Report, Shareholders, Stock market, SWOT analysis, Internal and External factors, Strategic analysis and planning, Management team, SWOT Equity in the Commons</p>	<p>http://www.sedar.com/</p> <p>Resources:</p> <p>Use of school-based computers and software including access to the Internet; and a variety of network applications such as Paint or MS Word, MS Publisher, Smart Ideas 8 (mind mapping) as well as more advanced design applications such as Photoshop, etc. (subject to student ability).</p> <p>If technology is not an option, then students could complete the work by hand and present their product on bristol board, journal, or in some other tangible manner suitable to the circumstances.</p> <p>NOTE:</p> <p>Past experience has indicated that students with even modest computer skills are able to access and use on-line versions of Annual Reports; however, it would be useful if the teacher had hard copies of Annual Reports in the classroom for distribution to students – enabling them to use highlighter markers, post-its and sticky notes during their reading.</p> <p>All companies that are publicly traded on the Toronto Stock Exchange manage company web sites that will have an Investor Relations link; as well as internal/external links to press releases and news stories related to their business activities.</p>
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MINDS ON	CONNECTIONS
<p>Challenging Statement</p> <p>Teacher asks students to consider how they feel about injustices that are derived from improper economic activity by posing the questions: <i>To what extent are we obligated as Catholics to respond, challenge, protest, and change?</i></p> <p>If students struggle to respond the teacher might suggest relating this statement to their own personal experience: <i>Have you ever had experiences in part-time or summer jobs where you witnessed wrongs being committed? How did you respond?</i></p> <ol style="list-style-type: none"> 1. Teacher holds up a pair of Nike shoes or Nike T-Shirt OR 2. Teacher holds up an empty Starbucks coffee cup OR 3. Teacher holds up a Wal-Mart ad (happy face) OR 4. Other another choice of a more accessible product or image (prop) that is commonly associated with a prominent company or brand <p>In doing so, teacher asks students to respond to the following question: <i>What immediately comes to mind when you see this (these) prop(s)?</i></p> <p>Students outline their thoughts, ideas, facts, opinions, etc. in point-form. While students are doing so the teacher sketches a simple chart on whiteboard with 4 sections (quadrant) as follows:</p> <ul style="list-style-type: none"> • Top Left = what you like... what you think is good... • Bottom Left = what you dislike... what you think is bad... • Top Right = what you think could be improved if... • Bottom right = what you think could go wrong if... <p>Charting Student Feedback</p> <p>Teacher instructs students to come up to the whiteboard to write up their response in the correct area of the quadrant and summarizes results.</p>	<p>Assessment for learning:</p> <ul style="list-style-type: none"> — Observe student participation in questions about the purpose or outcome of this activity — Determine if students can identify next step <p>Assessment as learning:</p> <ul style="list-style-type: none"> — Student realizes that all business analysis has to be based on subjective and objective thinking (informed opinions and critical analysis) — Students consider the variety of responses and ask their peers to explain

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	<p>Introduction to SWOT Analysis</p> <p>Once completed, teacher distributes Appendix A SWOT Analysis Template that illustrates strengths, weaknesses, opportunities, and threats in their proper quadrant. The teacher also provides a basic definition of these terms – consistent with the initial step in the exercise.</p> <p>Application of SWOT Analysis – convert feedback to criteria</p> <p>Teacher instructs students to scribe information from the whiteboard onto the SWOT Analysis Template, and make any additions or improvements that might improve the product. Teacher congratulates students on completing their first official SWOT Analysis (Optional: teacher hands out a business card to each student featuring the title: BUSINESS ANALYST prepared in advance using Microsoft Publisher template or an on-line application).</p> <p>Teacher provides some background on what a Business Analyst does, explaining that anyone involved in business whether they are investors, owners, managers, employees, etc. is actively engaged in the process of analyzing a business for its strengths, weaknesses, opportunities, and threats.</p>	<p>Assessment as learning:</p> <ul style="list-style-type: none"> — Students reflect on the process and come to appreciate that they all possess the basic skills required to become a business analyst (career focus)
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	ACTION	CONNECTIONS
	<p>Lecture and Directed Class Discussion</p> <p>Teacher uses Appendix B Teacher Notes: SWOT Equity in the Commons to outline the simple rules for successful SWOT analysis.</p> <p>Teacher uses Appendix C Descriptors: SWOT Equity in the Commons to teach students the business/strategic issues that fall under each of the four categories. Students take notes and ask questions.</p> <p>Teacher uses Appendix D Corporate Examples: SWOT Equity in the Commons to apply SWOT Analysis to one or more of the examples outlined including: Wal-Mart, Starbucks and/or Nike or a corporation selected by the individual, teacher or class.</p>	<p> Differentiated Learning:</p> <ul style="list-style-type: none"> — SWOT Analysis of a product can be presented in a variety of formats including: <ul style="list-style-type: none"> — SWOT template — Poster — Collage — Poem — Song — Performance — Journal

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	<p>SWOT Trial Run (Optional)</p> <p>Introduce Assignment</p> <p>Teacher uses Appendix E Assignment Outline: SWOT Equity in the Commons to present the assignment in the context of Catholic Social Teachings.</p>	<p>Assessment for and as learning:</p> <ul style="list-style-type: none"> — SWOT Trial Run: Students have the opportunity to work with a hard copy of an annual report — Use a highlighter or post-it notes to identify and mark relevant information — Ask the teacher or peers questions to ensure that they are on task
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	CONSOLIDATION	CONNECTIONS
	<p>Active Engagement</p> <p>Teacher uses Appendix F Assignment Rubric: SWOT Equity in the Commons to explain the assignment in more detail. Review the expectations and answer student questions. Students select a company and begin working on the assigned tasks.</p>	<p>Assessment of learning:</p> <p>Rubric: SWOT Equity in the Commons modified to effectively assess various presentation formats of final product</p>

	CONTINUED LEARNING OPPORTUNITIES
	<p>Further extensions to this lesson might include:</p> <ul style="list-style-type: none"> • Exit Card: Does the subjectivity in a SWOT analysis make it vulnerable to bias? • Sharing the SWOT Analysis findings to their chosen company through the company’s CONTACTS web link; follow-up if necessary to confirm that their message and information was indeed received by the company; and offer to have the BBI20 class provide free business consulting services to the company by conducting a more comprehensive analysis of how the company can benefit by increasing their SWOT Equity in the Commons.

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Appendix A

SWOT Analysis Template

Strengths	Weaknesses
Opportunities	Threats

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Appendix B

Teacher Notes: SWOT Equity in the Commons

Simple Rules for Successful SWOT Analysis

- be realistic about the strengths and weaknesses of your organization when conducting SWOT analysis
- SWOT should distinguish between where your organization is today, and where it could be in the future
- SWOT should always be specific – avoid grey areas
- always apply SWOT in relation to your competition – better than or worse than your competition
- keep your SWOT short and simple – avoid complexity and over analysis
- SWOT is subjective

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Descriptors: SWOT Equity in the Commons

Appendix C

Examples of Strengths

- Competitive advantages
- Capabilities – resources, assets, people, knowledge, etc.
- Strength of brand or products
- History of invention or innovation
- Location – network of locations or outlets
- Operational efficiencies – processes, systems, IT, communications, transportation, etc.

Examples of Weaknesses

- Poor value proposition of products and/or services
- Gaps in capabilities
- Lack of competitive ability
- History of product failures or recalls
- Operating weaknesses/inefficiency – processes/systems, IT, transportation, supply chain, cash flow, etc.
- Poor morale, commitment, leadership, etc.

Examples of Opportunities

- Industry trends/market developments – competitor weaknesses revealed
- Technology developments and innovations – early adaptor
- Global markets expanding – new market niches or geographic locations opening up
- Implementation of new competitive tactics, strategies, campaigns, etc.
- Business and product/service development
- Research and development breakthroughs leading to new products/services or leveraging opportunities

Examples of Threats

- Political, social, legal or environmental effects, obstacles or challenges
- Infrastructure decline or inefficiencies
- Competitor intentions or successes
- New technologies, services, ideas, etc.
- Changing priorities or focus of existing partners or collaborators
- Changing economic climate – interest rates, inflation, unemployment, etc.

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Appendix D

Corporate Examples: SWOT Equity in the Commons

1. SWOT Case Study: Wal-Mart

Strengths

Wal-Mart is a powerful multinational retail brand - value for money, convenience and a wide range of products all in one store; profit of approx. \$15.5 billion on revenue of approximately \$467 billion in 2012; extensive supply network; highly efficient and large-scale operating systems.

Weaknesses

World's largest grocery retailer – aggressive corporate culture, centralized control of its operations and management structure make it vulnerable in some areas e.g. high employee turnover, negative publicity, etc.

Opportunities

To take over, merge with, or form strategic alliances with other global retailers, focusing on emerging markets; growth of its own label products.

Threats

Being number one means that you are the target of competition; persistent labour-related challenges; increasing resistance from local communities

2. SWOT Case Study: Starbucks

Strengths

Starbucks Corporation is a very profitable organization, with a profit of approximately \$1.4 billion on revenue of approximately \$13 billion in 2012; very strong brand recognition; 150,000 employees at 20,000 locations in more than 60 countries world-wide.

Weaknesses

Profitability is subject to commodity price of coffee; premium pricing limits customer base; negative publicity.

Opportunities

A variety of new products and services can be tested or sold in their locations; e.g. Fair Trade products.

Threats

Starbucks are exposed to rises in the cost of coffee and dairy products; saturated markets in some countries; localized competition from regional and national brands.

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3. SWOT Case Study: Nike

Strengths

Nike is the premium global brand for sportswear, clothing, and footwear; strong research and development; high quality = brand loyalty; competitive corporate culture; continuity of leadership – founder Phil Knight is CEO.

Weaknesses

Often criticized with exploitation of child labour in overseas production facilities; premium pricing.

Opportunities

Product development and cross branding across product lines; scope of business and financial clout enables sponsorship of global events and promotional activities involving prominent/iconic sports figures.

Threats

Nike is exposed to aggressive competition from other global and national brands; global economic events can significantly impact profitability.

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Appendix E

Assignment Outline: SWOT Equity in the Commons

1. Select a company traded publicly on the Toronto Stock Exchange
Note: each student must select a different company (teacher approval)
2. Carry out a SWOT Analysis of that company as follows:

Identify a minimum of 3 specific strengths, 3 specific weaknesses, 3 specific opportunities and 3 specific threats that are clearly identified in the most recent Annual Report to Shareholders and provide the exact location within the Annual Report where this information is found (page #, section, sub-section)
3. Provide an external perspective of the company:

Research secondary sources such as print and on-line newspapers, magazines, etc. to better understand how the market views the company e.g. analysis or coverage of recent activities, issues, challenges, etc.

Identify a minimum of 2 specific strengths, weaknesses, opportunities, and threats from these various sources (source for each must be identified).
4. Illustrate strengths, weaknesses, opportunities, and threats in the form of a simple SWOT Diagram
Note: templates can be downloaded from the Internet or students create their own simple chart.
5. SWOT Equity in the Commons: extend your analysis to include company initiatives regarding the redistribution of income, community investment, charitable initiatives, sponsorships, scholarships, equity and inclusion, etc. (tangible/measurable).
6. Recommendations
Make a minimum of 3 recommendations regarding how the company might more effectively contribute to the Common Good – including at least 1 specific recommendation related to equity and inclusion

CCC and OECTA Partnership Teaching Resource
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Rubric: SWOT Equity in the Commons

Appendix F

SWOT Content	Level 4	Level 3	Level 2	Level 1
Focus on traditional business analysis	SWOT Analysis contains 3 or more points for each quadrant. A compelling explanation provided for each point.	SWOT Analysis contains 3 points for each quadrant. A convincing explanation provided for each point to explain its inclusion.	SWOT Analysis contains 2 points for each quadrant. A coherent explanation may or may not be provided for each point to explain its inclusion.	SWOT Analysis contains 0 - 1 point for each segment. Few or no relevant comments or opinions provided to explain its inclusion.
SWOT Content Focus on the Common Good – community investments, charitable initiatives that redistribute income (tangible efforts)	Level 4 SWOT Analysis contains more than 2 Common Good points for each quadrant. A compelling explanation provided for each point to explain its inclusion.	Level 3 SWOT Analysis contains 2 Common Good points for each quadrant. A convincing explanation is provided for each point to explain its inclusion.	Level 2 SWOT Analysis contains less than 2 Common Good points for each quadrant. A coherent explanation may or may not be provided for each point to explain its inclusion.	Level 1 SWOT Analysis contains no Common Good points for each segment. Only a few or no relevant comments or opinions are provided for each point to explain its inclusion.
Business Language Use of vocabulary, terms, spelling, grammar, conventions, and context	Level 4 Excellent use of vocabulary, terms, spelling, grammar, context – no errors	Level 3 Good use of vocabulary, terms, spelling, grammar, conventions and context – few errors	Level 2 Adequate use of vocabulary, terms, spelling, grammar, conventions and context – many errors	Level 1 Poor use of vocabulary, terms, spelling, gram-mar, conventions and context full of errors
Recommendations Identifying how the company effectively contributes to the Common Good and relates to equity and inclusion	Level 4 Assignment has 3 recommendations based on SWOT Analysis. Clear and compelling presentation.	Level 3 Assignment has 3 recommendations NOT clearly associated with SWOT Analysis. Somewhat clear and convincing presentation.	Level 2 Assignment has 1 or 2 recommendations NOT clearly associated with SWOT Analysis. Legible and coherent presentation.	Level 1 No specific or relevant recommendations.

	GRADE 10
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<p style="font-size: 24px; font-weight: bold;">Equity and Inclusive Education:</p> <p style="font-size: 24px; font-weight: bold;">From the Lens of the Catholic Social Teachings</p>	<p>Subject: Mathematics Code: MPM2P</p> <p>Lesson Title: Is income fairly distributed amongst countries of the world?</p> <p>Suggested length of time: 75-150 minutes</p> <p>Lesson Overview The analysis will lead to discussions about Economic Justice. This lesson will allow students to apply their understanding of quadratic and linear relations in order to analyze income data from the 20th century for pairs of countries.</p>
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CURRICULUM CONNECTIONS	CATHOLIC SOCIAL TEACHINGS & ONTARIO CATHOLIC SCHOOL GRADUATE EXPECTATIONS
<p>Mathematics MPM2P Strands: LR. Modelling Linear Relations QR. Quadratic Relations</p> <p>Overall and Specific Expectations: LR1. Manipulate and solve algebraic equations, as needed to solve problems LR1.02 determine the value of a variable in the first degree, using a formula (i.e., by isolating the variable and then substituting known values; by substituting known values and then solving for the variable. LR2 Graph a line and write the equation of a line from given information LR2.06 determine the equation of a line, given</p>	<p>The Catholic Social Teaching evident in this lesson: Economic Justice</p> <p>The Ontario Catholic School Graduate Expectations evident in this lesson include:</p> <p>An effective communicator who: 2 (c) presents information and ideas clearly and honestly and with sensitivity to others.</p> <p>A reflective, creative and holistic thinker who: 3 (c) thinks reflectively and creatively to evaluate situations and solve problems.</p>

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<p>its graph, the slope and y-intercept, the slope and a point on the line, or two points on the line.</p> <p>QR2. Identify characteristics of quadratic relations</p> <p>QR2.01 collect data that can be represented as a quadratic relation, from experiments using appropriate equipment and technology, or from secondary sources; graph the data and draw a curve of best fit, if appropriate, with or without the use of technology</p> <p>QR3. Solve problems by interpreting graphs of quadratic relations</p> <p>QR3.01 solve problems involving a quadratic relation by interpreting a given graph or a graph generated with technology from its equation</p>	<p>A collaborative contributor who: 5 (d) finds meaning, dignity, fulfillment and vocation in work which contributes to the Common Good.</p> <p>A responsible citizen who: 7 (f) respects and affirms the diversity and interdependence of the world’s peoples and cultures.</p>
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<p>Guiding Questions from the Framework</p>	
<p>These guiding questions have been selected from the framework focusing on:</p> <p>Equity and Inclusive Education:</p> <ul style="list-style-type: none"> • How do you see yourself as a valued and contributing member of this class, school, community, and society? <p>Catholic Social Teaching:</p> <ul style="list-style-type: none"> • What type of economic system might be consistent with Catholic values, respecting the dignity of all? • Consider balance: How much is enough? How much is too much? • When we see injustices that are derived from improper economic activity – to what extent are we obligated as Catholics to respond, challenge, protest, and change? <p>Ontario Catholic Graduate Expectations:</p> <ul style="list-style-type: none"> • How does the Catholic Social Teaching, Economic Justice, call us to respond or act: <ul style="list-style-type: none"> • as an effective communicator who presents information and ideas clearly and honestly and with sensitivity to others? • as a reflective, creative and holistic thinker who thinks reflectively and creatively to evaluate situations and solve problems? 	

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- as a collaborative contributor who finds meaning, dignity, fulfillment and vocation in work which contributes to the Common Good?
- as a responsible citizen who respects and affirms the diversity and interdependence of the world's peoples and cultures?

A scripture reading that inspired this lesson: "The righteous care about justice for the poor, but the wicked have no such concern." Proverbs 29:7

Critical Literacy:

- What kinds of issues of equity, power and social justice are relevant to the topic?
- How can we analyze the information presented for bias, reliability, fairness, and validity?

Teachers and students may select additional questions from the framework to guide their learning inquiry.

LEARNING GOALS

At the end of this lesson, students will know, understand and/or be able to:

- With and without technology, model secondary data using appropriate linear and quadratic models;
- Make predictions (extrapolation) using the line and curve of best fit;
- Validate predictions using additional data and defend choices using proper mathematical terminology.

Success Criteria, based on the Learning Goals, can be co-constructed as a class in language meaningful to students. The success criteria help students understand what to look for during the learning and what it looks like once they have learned. They identify the significant aspects of student performance that are assessed and/or evaluated (i.e., the "look-fors") in relation to curriculum expectations.

Sample Success Criteria

I can:


- Create scatter plots from secondary data and determine if a linear or quadratic model is appropriate to describe the trend
- With or without technology, determine the equation of the line, or curve, of best fit
- Use the equation to make predictions (extrapolate)
- Judge the validity of the prediction using additional secondary data
- Make convincing arguments using secondary data



CCC and OECTA Partnership Teaching Resource
Equity and Inclusion: Through the Lens of the Catholic Social Teachings

INSTRUCTIONAL COMPONENTS AND CONTEXT	
<p>Prior Learning</p> <p>Teacher Readiness: Prior to this lesson, the teacher will have:</p> <ul style="list-style-type: none"> • Familiarity using technology to create scatter plots, lines and curves of best fit • Comfort with students working in groups and facilitating whole group discussions where students share and debate <p>Student Readiness: Prior to this lesson, students will have:</p> <ul style="list-style-type: none"> • Created scatter plots, lines of best fit and quadratic curves of best fit using technology • Determine the equation of the line of best fit from a graph without technology • Manipulate and solve first degree equations <p>Terminology Common Good, Equity vs. Equality, Data trends, correlation, Line or curve of best fit, Extrapolation</p>	<p>Materials:</p> <p>Appendix A Matching Activity Appendix B Sets of Data (Group Work) Appendix C Analysis Task Appendix D Reflection and Exit Ticket Appendix E Teacher Resources to Support Function Modeling using Technology</p> <p>Handheld graphing technology (TI 83/84 or Nspire) or computer access (Fathom or Excel)</p> <p>Grid paper for scatter plots</p> <p>Internet Resources:</p> <p>See Appendix E Teacher Resources to Support Function Modeling using Technology</p> <p>Data from GapMinder World (http://www.gapminder.org/data/)</p>

MINDS ON	CONNECTIONS
<p>Whole Class → Discussion to set the context</p> <p>Define Common Good as how the community strives to ensure the benefit of everyone in the community. Discuss ways how the school community strives to benefit the Common Good.</p> <p>Discuss how the scripture "The righteous care about justice for the poor, but the wicked have no such concern" applies to how countries conduct their economies and help other countries.</p>	


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<p>Whole Class → Grouping Strategy</p> <p>Using Appendix A Matching Activity randomly distribute the cards so each student gets one card. Students form triads by matching the equation, graph and table of values for a particular linear relation. There are cards for 9 linear relations in Appendix A. (If the class has more than 27 students make additional copies of cards.)</p> <p>Triads → Think/Pair Share</p> <p>Pose the following questions one at a time:</p> <p style="padding-left: 40px;"><i>What is the difference between equality and equity?</i> <i>How could you measure the average income per person for a country?</i></p> <p>Record the important points on the blackboard/whiteboard/chart paper and retain for later use.</p>	 Differentiation of learning: <ul style="list-style-type: none"> — Readiness as some students may require support understanding the terms.
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ACTION	CONNECTIONS
<p>Whole Class → Setting the Context</p> <p>Each group will analyze average income for a pair of countries from the same part of the world. The data for each country is the average income per person (in USD) for each decade in the 20th century. The source is the data is GapMinder and income is defined as the country's GDP / population for each year given.</p> <p>Distribute the data sets from Appendix B Sets of Data (Group Work) so each group has a pair of countries. You can assign data sets, randomly assign them, or have students make the choice. Ensure that students understand the meaning of GDP / population.</p> <p>Triads → Technology Application</p> <p>Assign roles for the members of the group to ensure equitable distribution of work (i.e. recorder, technology specialist, reporter)</p>	 Differentiation of Learning: <ul style="list-style-type: none"> — By student interest as students can choose a set of data to analyze  Differentiation of learning: <ul style="list-style-type: none"> — By readiness since one data set (Namibia & South Africa) has fewer data points

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	<p>Distribute Appendix C Analysis Task for students to record their analysis as they model the data for their pair of countries. Each pair of countries usually has a country that a linear model is appropriate and the other country that a quadratic model is appropriate.</p> <p>Encourage students to graph both sets of data on one scatter plot so comparisons can be made. Some students may require support to accomplish this using technology.</p> <p>After students complete Appendix C, monitor that they have chosen appropriate models and made predictions for 2010 using their equations. If they are ready to proceed, distribute Appendix D Reflection and Exit Ticket and have them validate the accuracy of their prediction using 2010 data for their country.</p>	<p>Assessment for learning:</p> <ul style="list-style-type: none"> — Monitor pairs during activity to check for application of scatter plots, lines and curves of best fit — Provide descriptive feedback as necessary
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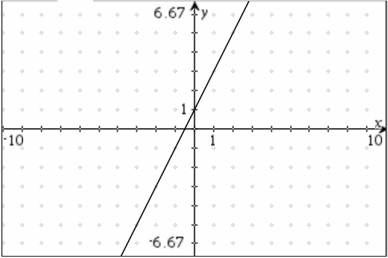
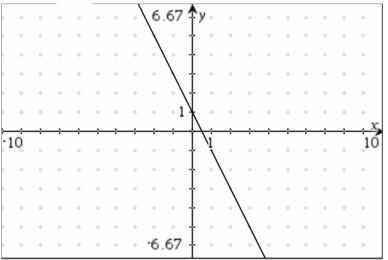
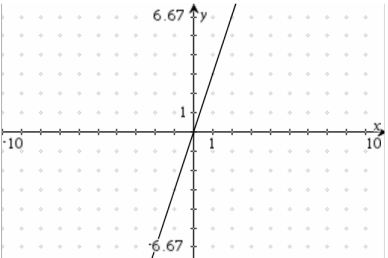
CONSOLIDATION	CONNECTIONS	
	<p>Whole Class → Sharing & Discussion</p> <p>Invite groups to share their analysis, predictions and validation. Students should be able to offer reasons why their prediction was different from the 2010 data.</p> <p>Students need to see that sometimes countries in close proximity can have very different income levels. Students should be able to offer reasons why their two countries have different incomes. Record on the blackboard/whiteboard/chart paper a brief summary.</p> <p>Individual → Reflection/Exit Ticket</p> <p>Briefly review the summary for the Minds On discussion. On Appendix D Reflection and Exit Ticket students write a 100-200 word reflection.</p>	<p>Assessment as learning:</p> <ul style="list-style-type: none"> — By writing a reflection, students understand that they are responsible to address inequities between countries. <p> Differentiation of Learning:</p> <ul style="list-style-type: none"> — Based on interest since students can reflect on ways they can make a change

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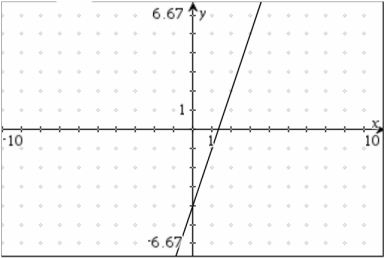
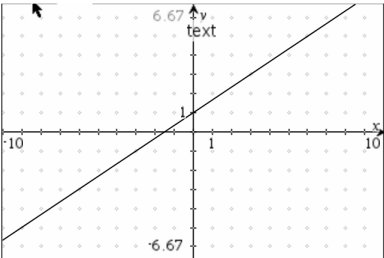
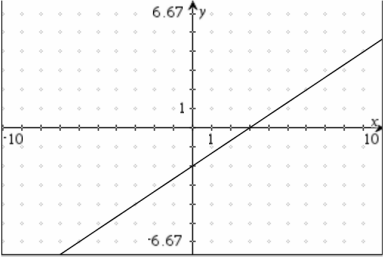
CONTINUED LEARNING OPPORTUNITIES	
	<p>Further extensions to this lesson might include:</p> <ul style="list-style-type: none">• Further analysis of World Bank Indicator data found at http://www.gapminder.org/data/ • Cultivating an interest in projects ensure equitable distribution of wealth in the school, community or internationally such as:<ul style="list-style-type: none">○ http://www.sharelife.org/Public/Home.aspx○ http://www.ccare.ca/○ http://care.ca/○ http://www.acdi-cida.gc.ca/acdi-cida/acdi-cida.nsf/eng/home○ http://www.idrc.ca/EN/Pages/default.aspx • Contact local community organizations for data on income disparity in the community.

Matching Activity

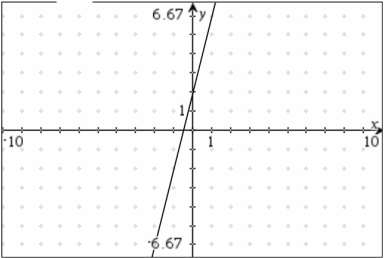
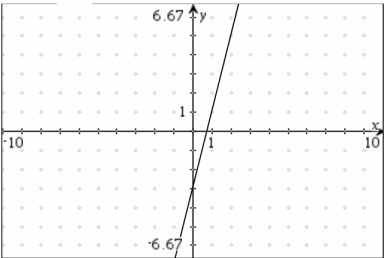
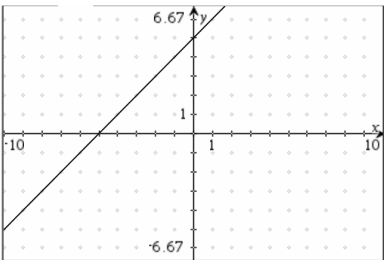
Directions: Cut the following table into to 27 slips of paper

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Sets of Data (Group Work)

Directions: Each group gets one pair of countries to analyze. Cut the table in to 9 pieces.

<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #cccccc;"> <th style="padding: 5px;">Year</th> <th style="padding: 5px;">Australia</th> <th style="padding: 5px;">Malaysia</th> </tr> </thead> <tbody> <tr><td style="padding: 5px;">1900</td><td style="padding: 5px;">5432</td><td style="padding: 5px;"></td></tr> <tr><td style="padding: 5px;">1910</td><td style="padding: 5px;">7051</td><td style="padding: 5px;"></td></tr> <tr><td style="padding: 5px;">1920</td><td style="padding: 5px;">6450</td><td style="padding: 5px;">1382</td></tr> <tr><td style="padding: 5px;">1930</td><td style="padding: 5px;">6372</td><td style="padding: 5px;">2036</td></tr> <tr><td style="padding: 5px;">1940</td><td style="padding: 5px;">8345</td><td style="padding: 5px;">1590</td></tr> <tr><td style="padding: 5px;">1950</td><td style="padding: 5px;">10031</td><td style="padding: 5px;">1940</td></tr> <tr><td style="padding: 5px;">1960</td><td style="padding: 5px;">11898</td><td style="padding: 5px;">1904</td></tr> <tr><td style="padding: 5px;">1970</td><td style="padding: 5px;">16273</td><td style="padding: 5px;">2587</td></tr> <tr><td style="padding: 5px;">1980</td><td style="padding: 5px;">19506</td><td style="padding: 5px;">4551</td></tr> <tr><td style="padding: 5px;">1990</td><td style="padding: 5px;">23152</td><td style="padding: 5px;">6386</td></tr> <tr><td style="padding: 5px;">2000</td><td style="padding: 5px;">29242</td><td style="padding: 5px;">10161</td></tr> </tbody> </table> <p style="text-align: center; margin-top: 20px;">Source: Gapminder: Income per person (GDP/capita)</p>	Year	Australia	Malaysia	1900	5432		1910	7051		1920	6450	1382	1930	6372	2036	1940	8345	1590	1950	10031	1940	1960	11898	1904	1970	16273	2587	1980	19506	4551	1990	23152	6386	2000	29242	10161	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #cccccc;"> <th style="padding: 5px;">Year</th> <th style="padding: 5px;">Canada</th> <th style="padding: 5px;">Mexico</th> </tr> </thead> <tbody> <tr><td style="padding: 5px;">1900</td><td style="padding: 5px;">4225</td><td style="padding: 5px;">1709</td></tr> <tr><td style="padding: 5px;">1910</td><td style="padding: 5px;">5900</td><td style="padding: 5px;">2102</td></tr> <tr><td style="padding: 5px;">1920</td><td style="padding: 5px;">5604</td><td style="padding: 5px;">2395</td></tr> <tr><td style="padding: 5px;">1930</td><td style="padding: 5px;">6981</td><td style="padding: 5px;">2096</td></tr> <tr><td style="padding: 5px;">1940</td><td style="padding: 5px;">7790</td><td style="padding: 5px;">2403</td></tr> <tr><td style="padding: 5px;">1950</td><td style="padding: 5px;">10581</td><td style="padding: 5px;">3294</td></tr> <tr><td style="padding: 5px;">1960</td><td style="padding: 5px;">12701</td><td style="padding: 5px;">4433</td></tr> <tr><td style="padding: 5px;">1970</td><td style="padding: 5px;">17487</td><td style="padding: 5px;">6451</td></tr> <tr><td style="padding: 5px;">1980</td><td style="padding: 5px;">23474</td><td style="padding: 5px;">9320</td></tr> <tr><td style="padding: 5px;">1990</td><td style="padding: 5px;">27387</td><td style="padding: 5px;">9103</td></tr> <tr><td style="padding: 5px;">2000</td><td style="padding: 5px;">32449</td><td style="padding: 5px;">10895</td></tr> </tbody> </table> <p style="text-align: center; margin-top: 20px;">Source: Gapminder: Income per person (GDP/capita)</p>	Year	Canada	Mexico	1900	4225	1709	1910	5900	2102	1920	5604	2395	1930	6981	2096	1940	7790	2403	1950	10581	3294	1960	12701	4433	1970	17487	6451	1980	23474	9320	1990	27387	9103	2000	32449	10895
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Year	China	Japan
1900	802	1736
1910	810	1883
1920	892	2403
1930	1016	2572
1940	861	3958
1950	394	2645
1960	583	5489
1970	685	13375
1980	934	18488
1990	1647	25870
2000	3012	28560

Source: Gapminder: Income per person (GDP/capita)

Year	Finland	Russia
1900	2293	2109
1910	2620	2379
1920	2536	1014
1930	3664	2555
1940	4426	3782
1950	5846	5013
1960	8563	6960
1970	13162	9835
1980	17797	11517
1990	23181	12633
2000	27172	8571

Source: Gapminder: Income per person (GDP/capita)

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Year	Germany	Hungary
1900	4684	3206
1910	5253	3812
1920	4387	3257
1930	6235	4581
1940	8478	5005
1950	6090	4726
1960	12091	6954
1970	17009	9582
1980	22148	12019
1990	24996	12309
2000	29727	13592

Source: Gapminder: Income per person (GDP/capita)

Year	India	Singapore
1900	604	2181
1910	692	2702
1920	622	1911
1930	701	3016
1940	654	3245
1950	580	3533
1960	696	3426
1970	791	6994
1980	844	14104
1990	1160	23143
2000	1648	36835

Source: Gapminder: Income per person (GDP/capita)

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Year	North Korea	South Korea
1900	788	673
1910	819	699
1920	1067	910
1930	990	845
1940	1531	1307
1950	870	743
1960	1200	1137
1970	2262	2141
1980	3373	4331
1990	3373	9764
2000	1690	16996

Source: Gapminder: Income per person (GDP/capita)

Year	Morocco	Spain
1900		2677
1910		2840
1920		3263
1930		3927
1940		3118
1950	1683	3280
1960	1537	4603
1970	1869	9470
1980	2628	13791
1990	3002	18065
2000	3073	23410

Source: Gapminder: Income per person (GDP/capita)

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Year	Namibia	South Africa
1950	2389	4575
1960	2893	5546
1970	3674	7669
1980	4167	8577
1990	3472	7787
2000	4023	7454

Source: Gapminder: Income per person (GDP/capita)

Is income per person fairly distributed between countries located near each other?

Action:

Gapminder is an organization that gathers data on countries around the world so that comparisons can be made. For each country, the average income per person (\$US) for each decade from 1900 until 2000 has been gathered. Average income is calculated by dividing a country's Gross Domestic Product (GDP in USD) by its population.

Analysis Task:

Each group will analyze data from a pair of countries located in the same geographic part of the world. You will apply your knowledge of linear and quadratic functions in order to compare the income per person in the countries. You will answer each question below. Be prepared to share your analysis with the whole class.

1. Using technology, create a scatter plot of income vs. year. Graph both sets of data on one scatter plot. Make a sketch of your scatter plot.

2. Would a linear or a quadratic model be appropriate to describe the trend in each country's set of data. For each country, provide reasons for your choice.

3. If you chose a quadratic model, determine the regression equation using technology. Write the equation.

4. If you chose a linear model, determine the equation of the line of best fit either:
 - a. using technology, **or**
 - b. choosing two representative points on the scatter plot and using them to find the equation of the line of best fit without technology

5. Using the equations you found for each country, make a prediction of the income for 2010 without using technology. Show your work.

Reflection and Exit Card

Average Income per person for 2010

Australia	34885	India	2961	North Korea	1549
Canada	35219	Japan	30732	Russia	14208
China	8143	Malaysia	13185	Singapore	48325
Finland	31053	Mexico	11391	South Africa	9322
Germany	32887	Morocco	4263	South Korea	25080
Hungary	16983	Namibia	5160	Spain	26780

Source: Gapminder: Income per person (GDP/capita)

1. For each of your countries, compare the prediction you made using the equation with the actual income from the table above. How accurate was your prediction?
2. If your prediction was not close to the actual income offer reasons why there could be a difference?
3. Your two countries are from the same part of the world but they have very difference incomes per person. Provide some reasons why the incomes for the two countries are very different.

Reflection:

Economic Justice is the equitable distribution of wealth. This means that every person should have enough to live a life with dignity. What can you do in your class, school, community and internationally to support Economic Justice? Describe as many specific actions as possible. (100-200 words expected)

Teacher Resources to Support Function Modeling using Technology

TI 83/84 Graphing Calculator

<http://education.ti.com/en/us/pd/online-learning/tutorials#navigation-tab-contents=navigation-element-tab-contents-1>

See Atomic Learning videos in *C. Working with Lists*

http://mthsc.clemson.edu/ug_course_pages/view_item.py?id=82

http://fym.la.asu.edu/~tturner/MAT_117_online/Regression/Linear%20Regression%20Using%20the%20TI-83%20Calculator.htm

<http://www.pstcc.edu/facstaff/jahrens/calculator/stats83.pdf>

<http://www.online.math.uh.edu/GraphCalc/> (See videos 17-20)

TI Nspire Handheld (Non-CAS or CAS version)

<http://education.ti.com/en/us/pd/online-learning/tutorials#navigation-tab-contents=navigation-element-tab-contents-0>

See Atomic Learning videos in “C. Lists and Spreadsheets”

<http://mathbits.com/MathBits/TINSection/Statistics2/ExponentialModel.html>

Computer Software (Fathom, Excel & Graphmatica)

<http://www.keycurriculum.com/products/fathom>

<http://www.edugains.ca/resources/LearningMaterials/TechnologySupports/SoftwareSupport/FathomResources.pdf>

http://staff.district87.org/powelln/Calculus/Chapter1/modeling_howto.doc