

Cushing Academy

LEADERSHIP FOR THE 21<sup>ST</sup> CENTURY

## **Developing 21<sup>st</sup> Century Curricula for High School Students**

**A Collaborative Project led by**

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The following pages represent the collaborative work of Cushing Academy faculty and students, and Dr. Nick Bostrom. The curriculum development project is the first of many activities and projects planned with visiting scholars from the James Martin 21<sup>st</sup> Century School at the University of Oxford. This project and those that follow will be made available as freeware for high schools across the United States and around the world.

## *Application of 21<sup>st</sup> Century Techniques and Skills*

### **I. Developing Meta-cognitive Skills**

**Overall Rationale: To make students capable of meeting the challenges that the remainder of this century will bring, we must develop skills in practical effective rationality and mental flexibility. To that end, students must improve their ability to identify biases, both in their own thinking and in the prevailing opinions of their society. Students need to develop their capability of making reasonable estimates under conditions of uncertainty and to refine their ability to detect nonsense and factually incorrect statements made by figures of authority. Students must also be able to more easily recognize opportunities and existing structures in order to utilize those structures and opportunities to respond to changing circumstances in politics, in the environment, and in the economy.**

#### \*"My favorite liar" teaching technique

Technique: The teacher states at beginning of lesson that he/she will make one false statement. The students must figure out what the false statement was. The false statement should not be too obvious but it should be possible for a thoughtful student who is paying close attention to make a good guess as to when the "lie" occurs. If no student has identified the lie before the end of the class, the students will briefly discuss to see if they can figure it out together. At the end the teacher reveals what the false statement was and how the students could have figured it out.

*\*Rationale: we need to create critical thinkers for the 21<sup>st</sup> Century so that the students can absorb, interpret, and respond discriminatingly to information presented to them. This technique can also help encourage the students to pay attention to the lesson.*

*\*Additional work required: none; get Jim on board to do this in assembly with his introduction of technology and other topics/news stories. This could be done using multiple choice polling. Does the majority get it right?*

#### \*Multiple histories teaching technique

Technique: Identify some relatively recent historical event (WWII or later), and examine how this event is covered in history textbooks from different parts of the world. For example, students could be assigned to read in translation the relevant passages of history books on WWII or the Vietnam War from Japan, Russia, and China, as well as the U.S. It is important to use countries that have disparate viewpoints from the U.S. to examine how others view historical events in comparison to a U.S./Eurocentric version of those events

*\*Rationale: we need to understand how the same historical episodes can be viewed and framed differently by different actors. This will improve understanding of the outlook of others, which is important in a global age. Moreover, this exercise will enable students to reflect on the standard way that history is told in their own country, thereby enabling them to reflect more critically on possible biases or partialities inherent in what they are taught. What are the facts that everyone agree on? What is interpretation and possibly self-serving nationalistic bias?*

*\*Additional work required: find or commission the requisite translations. This resource could then be made available to other schools (note: copyright from publishers of the textbooks used would need to be obtained and possibly paid for).*

### \*Global Snapshots teaching techniques

Technique: Translations are provided of recent front pages or editorial pages of some big mainstream newspaper from different countries. Editorials should discuss the same event. Sources should be selected so as to represent widely different opinions, e.g. "How is some recent U.S. foreign affairs issue covered by the mainstream in Saudi Arabia?". In Bhutan? In Venezuela? In China? A classroom discussion is then held to discuss the similarities and differences in these different accounts? What accounts for the differences? Are there relevant voices that are only expressed in some countries and not others?

*\*Rationale: gaining a more global perspective on current events, and reflecting critically about how these events are framed by the media in the U.S. and in other parts of the world allows students to make more informed decisions.*

*\* Additional work required: acquire the translations; perhaps get ESL and/or Modern Language students involved- this might be a class or an activity or a lesson in an existing class; publish the international perspective document that is generated online*

### \*Written Self-Reflection teaching technique

Technique: Students will journal about their own biases in response to the topics presented in class. They will seek to identify the preconceived notions unique to their experience that color their understanding of the changing world. This technique could also be modified to include presentation of one's thoughts by auditory and/or visual means.

*\*Rationale: gaining a greater understanding of the psychological and social influences on one's own thinking and decision making creates a better understanding of why others decide as they do and what creates controversy among individuals and countries*

*\*Additional work required: none*

### \*Cognitive/Heuristic Articles teaching technique

Technique: Students will read current and classical literature from the field of heuristics and meta-cognitive study. These readings can be applied to the particular area of interest. For example, students could read an article on status quo bias and discuss how this bias in human thinking influenced people to hold to the geocentric universe theory, even when preliminary evidence seemed to suggest the heliocentric theory.

*\*Rationale: we need to create students who understand how they think so they can think more effectively*

*\*Additional work required: access and acquire the readings*

*\*Possible sources: <http://www.nickbostrom.com> , <http://lesswrong.com> , <http://www.overcomingbias.com/> , *Judgment under Uncertainty: Heuristics and Biases* (Kahneman, Slovic, & Tversky, eds. 1982)*

### \*Fermi Estimation teaching technique

Technique: Students will be provided with subjects to estimate. This process creates a sense of scale and plausibility and helps students to understand what they need to know in order to make a reasonable guess and in order to recognize statistics or information presented that are not reasonable, not factual, or not well founded. In addition, the technique also aids students in breaking down a problem into smaller, more manageable fragments that can be estimated. When utilizing this form of estimation one can test for data points (Ex: there is a total shoe surface area of  $X$  sq.ft. in Ashburnham) or for probabilities (Ex: there is an 80% certainty that the total shoe surface area is  $X$  sq. ft). The following are possible examples: How big is the carbon footprint of Cushing Academy? How much electricity does CA use? How much gas does the fleet of CA vans use/what is the gas bill? What is the overall salary at CA? How long does it take to cut the grass at CA before the mower starts again? How can we use poker or other games of chance as a means of learning estimation and probability? (The winner of the poker game should get something, perhaps bonus points, for their chips). What would be the death count of invading vs. dropping the bomb? Truman had this data and had to answer this question.

*\*Rationale: we need to create a sense of scale in students and a sense of probability for different events and the ability to apply the understanding of the probabilities of possible outcomes to real events*

*\*Additional work required: need clear data sets of known outcomes, need to gather examples/create a project*

\*Media Studies suggested course

Course description: The course would include some of the aforementioned techniques, most notably the Multiple Histories and Global Snapshot techniques, and would be based on the idea of teaching students to become more critical consumers of information, particularly that which is delivered through the television media. By examining the assertions of political pundits and others and then comparing those predictions with the actual outcomes, students will begin to realize through the collection of data, that they should indeed not believe everything they hear. Further, students will be asked to reflect on and investigate influence of the media in actually affecting the outcomes of political, social, and even scientific events. This discussion may also extend to the inclusion of the role of social contacts, such as family and peers, in the creation of biases and in the influencing of decision making.

*\*Rationale: we need to assist students in honing their ability to sort fact from fiction or opinion in the media so that they can create their own interpretation of the world and not simply accept the version that is presented to them.*

*\*Additional work required: create the course curriculum and secure texts/readings; need to work it into the existing schedule and work load of current faculty available*

*\*Possible Source: Expert Political Judgment: How Good Is It? How Can We Know?(Tetlock 2006)*

## **II. Developing Presentation Skills**

**Overall Rationale: Adults in the 21<sup>st</sup> Century, as in ages past, will be asked to communicate their ideas and to work in cooperation with one another in order to solve problems from the simple to the most complex. Once students are able to critically interpret the information to which they are exposed, it is only through manipulating and modifying existing knowledge that they will build solutions and it is only through solid communication that those solutions may be applied. From negotiating for peace to slowing our misuse of natural resources to inventing new technologies that will aid in our quest for longevity as a species to marketing those new technologies, communication will be the common thread in whether or not the intelligence of *Homo sapiens* is able to mitigate our more destructive actions.**

### \*Presentation suggested course

Course description: This course may be offered as a term long course or as a one-time partial day seminar. Students will be exposed to specific guidelines for presentation including, but not limited to proper dress, the role of vocal intonation and modulation in successful presenting, the use of different rhetorical styles, and the optimum structuring of presentations and visual aids. In addition to the instruction of this course or seminar, a document will be published online as a reference for students and as a guide for faculty rubrics for the evaluation of student presentations.

*Rationale: students need to have highly developed modes of communication for their future endeavors at university and in the work force. Highly skilled communicators are the people that can shape both public opinion and policy, have the ability to apply the lessons they have learned, and are able to help others comprehend ideas that are new, foreign, or as yet untested.*

*Additional work required: create the course curriculum and secure texts/readings; need to work it into the existing schedule and work load of current faculty available*

### \*Presentation teaching technique

Technique: The instructor introduces a topic and students are charged with researching that topic quickly (within a few hours to a day) and then present their understanding of the topic with supportive evidence from their research. In order to complete this task successfully, the students will need to acquire a number of sources and evaluate them quickly. In addition, the students will be judged on not only the information collected, but also on the basis of their presentation skills. If possible, instructors who specialize in the topic will be asked to evaluate the student's work. For example the drama teacher could evaluate the oration, the physics instructor would evaluate the information presented on a topic such as ballistic missiles, and the history instructor would evaluate information presented on a topic related to his/her discipline. The students would then watch short video clips on their topics from reputable sources such as [www.TED.com](http://www.TED.com) and they would compare their performance with the expert's dissemination of information, using it to evaluate and improve upon their presentation technique, as well as their collection of information. Specifically, students will evaluate their presentation for the inclusion of information also included in the expert's presentation.

*Rationale: Students are faced with countless decisions regarding which materials to use in their research. The task is no longer how to find the material, but how to sort through it and select the most helpful items. This technique will allow students to practice the swift critical analysis of the copious materials to which they have access and it will also allow them to reflect upon their own success in utilizing the best material. In addition, students will gain experience in delivering presentations, a core skill for success as an adult in any field.*

*Additional work required: finding relevant videos to use, building evaluative rubrics and selecting appropriate topics for the students to research*

\* Self evaluation of writing teaching technique

Technique: In a similar exercise, students will be assigned an article from a highly regarded source, such as a peer reviewed journal or primary source. At the time in which the article is assigned, only a portion of the article is given to the students. The students read the article fragment and then use their research skills to gather information and themselves write the remainder of the article based on the information that they collected. The student is then provided the end of the article and must compare their article end to the true end of the article. The students will learn about the important information to include, as well as learning about proper writing structure. This process may also be modified to include peer editing.

*Rationale: See above.*

*Additional work required: finding relevant readings to use, building evaluative rubrics and selecting appropriate topics for the students to research*

*It is important to note that the two techniques presented above work best with small class sizes.*

\* Debate Society suggested course or activity

Course description: Students will learn the techniques of rhetorical oration and will gain skills in researching and presenting their position on a number of controversial topics. Subsequent to the establishment of the course, the students involved will compete in interscholastic debates with peer schools.

*Rationale: The respectful and effective communication inherent in debate is comprised of a set of skills that can be taught and honed. In the 21<sup>st</sup> Century, conflict resolution and creative problem solving will provide us with the answers to many problems; however, communication of those solutions is paramount, as is the ability to set aside bias in order to move toward the realization of common goals.*

*Additional work required: organization of the course or club; securing topics, coaching techniques, and rules for debating*

## HISTORY

### FASCISM IN THE 21<sup>ST</sup> CENTURY – WHAT IF GERMANY HAD “WON” THE WAR?

#### FOR SOPHOMORE HISTORY

Historical Focus – The Battle of Britain: What if Britain had sued for peace?

#### Objectives:

- To examine the role that luck (Britain running out of planes just when Germany ended attack), technology (Role of Radar), and courage (Churchill, British People, and bombing), play in history: Battle of Britain.
- To explore how the contemporary world might be different had Germany won the war.
- To examine the role that doctrines play in the unfolding of history – e.g. Victory of Fascism.
- To foster speculative and critical thinking skills.

#### Essential Questions:

What would a Fascist 21<sup>st</sup> Century Europe look like?

What new world alliances might have emerged?

What would have been the impact of an ongoing program of eugenics and ethnic cleansing given the biological and technological advances of the 21<sup>st</sup> Century?

Would America still have become a world power? What would have happened to spread of liberal/democratic thought?

#### Concepts:

Impact on World Political Systems – Role of Fascist Totalitarianism vs. Democratic/Liberal Institutions

Impact on Human Rights - Fascism vs. Human/Civil Rights Movements

Genetic Engineering – Eugenics and Race: Bio-Ethics in an age of Social Darwinism

International Relations – Fascism vs. Communism (A different Kind of Cold War)

Impact on Third World – 3<sup>rd</sup> World Independence Movements vs. Fascist Colonialism

#### Activities:

Research: What are the core historical trends at work in 1944?

Speculation: Write an alternative history time-line.

Presentation: Creative Powerpoint

Final Debate – Better/DifferentWorld?

**ENGLISH**  
**BRAVE NEW WORLD – DOES DYSTOPIA EXIST TODAY?**  
**FOR ENGLISH LIT AND COMP II**

Literary/Social Focus: What is the role of dissent and what is its impact?

**Objectives:**

- To examine the perception and possible existence of dystopia within the text and compare it to that of the contemporary world
- To foster speculative and critical thinking skills.

**Essential Questions:**

- What does Dystopia look like?
- What forces create Dystopia within the text and within our contemporary society?
- What are the responses of people to the perception of living in a dystopia?
- Is modern America a dystopia and how does this change the perception of this country internally and externally?

**Concepts:**

- The role of personal freedom and conviction
- The role of perception and its interaction with propaganda
- Background on the gay marriage debate

**Activities:**

- Reading: *Brave New World* (Huxley 1932); Defense of America Act (1996)
- Viewing: YouTube video on gay marriage protest
- Discussion: What are the consequences of disagreeing with the majority/government? What are your own experiences or observations of dissent?

**SCIENCE  
MOMENTUM  
FOR CONCEPTUAL PHYSICS**

Scientific Focus: What is momentum and what is its importance?

**Objectives:**

- To define the term “momentum”
- To calculate and algebraically manipulate momentum equations
- To foster speculative and critical thinking skills.

**Essential Questions:**

- What is momentum and how does it relate to the previously learned concepts of velocity and mass?
- What forces are at work in collisions?
- How are elastic collisions different from inelastic collisions?
- How is the concept of momentum applied to modern life?

**Concepts:**

- The definition and basic equation (momentum = mass \* velocity)
- The application of momentum in the automobile industry’s crash testing and brake testing
- The application of momentum in the use of satellites: How much velocity is needed to break free of gravity? What is the force of a satellite that falls out of orbit and impacts the ground? What was the force of the meteor that hit the Earth, ending the reign of the dinosaurs?

**Activities:**

- Practical Application:
  - Egg Drop Lab,
  - Toy Car Track Collisions Lab,
  - Red Rover Lab
    - If you know the weight of a person and how fast they are running
    - Then you can calculate the required momentum for breaking through the line in Red Rover
- Reading: Conceptual Physics text, articles on meteors and/or satellites
- Presentation:
  - Oral presentation of the lab report as one might present a thesis defense
  - Students could present on the “real-life” applications of momentum
    - Crash tests
    - How much time do you need to brake for a red light at given speeds?
    - How much momentum would a meteor need to have to make a crater of a certain size or to kick up enough dust to cause climate change?

**Technology:**

- Vernier track and photogates
- PowerPoint for teaching and for presentations

**Relation to Next Lesson/Other Classes:**

- Relates back to prior concepts: velocity and mass
- Connects to math class:
  - Algebra classes could take the data collected and use it in their calculations of algebraic equations
  - Geometry could take the concept of collisions and study the angles required for specific results in a game of billiards
    - Students could roll balls in chalk or paint to track the angles and they could measure the velocity with stop watches
    - Students could film the rolling of the balls and slow it down to observe
    - Students could be tested or quizzed by setting up pool shots (What angle did you shoot? What angle should you have shot?)

**MODERN LANGUAGES  
DIALECTS  
FOR FRENCH, SPANISH, CHINESE**

Linguistic/Social Focus: What is the influence of dialect on perception and understanding?

**Objectives:**

- To become familiar with the different dialects common to the language studied
- To speak with and listen to native speakers of different dialects
- To study the influence of dialect on the biased perception of others, both within the United States and within the country of origin for the language studied (Ex: What does a Southern drawl make a person from the Northeast think about the speaker? What suppositions would a St. Lucian patois create in the mind of a speaker of Parisian French?)
- To foster a greater understanding of the biases associated with dialects and to examine those stereotypes

**Essential Questions:**

- What are the differences in the audio quality of different dialects in the language studied?
- What are the origins of those elocutionary differences if they are known?
- How do “accents” influence our perceptions of others?
- Are there studies that support or refute the idea that dialect is correlated with specific skill sets?

**Concepts:**

- Understanding of language pronunciation
- Recognition of biases associated with regional dialects in the US
- Acquisition of a catalog of regional dialects from the language studied

**Activities:**

- Speaking: students will practice listening and speaking with native speakers who use a variety of dialects. These students will come from our international population.
- Viewing: students will view a film clip from a documentary on dialects in the US and examine their own biases based on their perceptions
- Presentation: Oral presentation of the lab report as one might present a thesis defense; also students could present on the “real-life” applications of momentum