

**Main Criteria:** Forward Education  
**Secondary Criteria:** CSTA K-12 Computer Science Standards  
**Subjects:** Mathematics, Science, Technology Education  
**Grades:** 5, 6, Key Stage 2

## Forward Education

### How Wind Turbines Capture Kinetic Energy

**CSTA K-12 Computer Science Standards**  
**Technology Education**  
 Grade 5 - Adopted: 2017

<b>LEVEL</b>	<b>CST A.1B.</b>	<b>Level 1B (Ages 8-11)</b>
<b>STRAND / COURSE</b>	<b>1B-NI.</b>	<b>Networks &amp; The Internet</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Cybersecurity</b>

LEARNING OUTCOME      1B-NI-05. Discuss real-world cybersecurity problems and how personal information can be protected. (P3.1)

<b>LEVEL</b>	<b>CST A.1B.</b>	<b>Level 1B (Ages 8-11)</b>
<b>STRAND / COURSE</b>	<b>1B-AP.</b>	<b>Algorithms &amp; Programming</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Variables</b>

LEARNING OUTCOME      1B-AP-09. Create programs that use variables to store and modify data. (P5.2)

<b>LEVEL</b>	<b>CST A.1B.</b>	<b>Level 1B (Ages 8-11)</b>
<b>STRAND / COURSE</b>	<b>1B-AP.</b>	<b>Algorithms &amp; Programming</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Control</b>

LEARNING OUTCOME      1B-AP-10. Create programs that include sequences, events, loops, and conditionals. (P5.2)

<b>LEVEL</b>	<b>CST A.1B.</b>	<b>Level 1B (Ages 8-11)</b>
<b>STRAND / COURSE</b>	<b>1B-AP.</b>	<b>Algorithms &amp; Programming</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Program Development</b>

LEARNING OUTCOME      1B-AP-13. Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences. (P1.1, P5.1)

LEARNING OUTCOME      1B-AP-16. Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development. (P2.2)

<b>LEVEL</b>	<b>CST A.1B.</b>	<b>Level 1B (Ages 8-11)</b>
<b>STRAND / COURSE</b>	<b>1B-IC.</b>	<b>Impacts of Computing</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Social Interactions</b>

LEARNING OUTCOME 1B-IC-20. Seek diverse perspectives for the purpose of improving computational artifacts. (P1.1)

**CSTA K-12 Computer Science Standards  
Technology Education  
Grade 6 - Adopted: 2017**

<b>LEVEL</b>	<b>CST A.2.</b>	<b>Level 2 (Ages 11-14)</b>
<b>STRAND / COURSE</b>	<b>2-DA.</b>	<b>Data &amp; Analysis</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Inference &amp; Models</b>

LEARNING OUTCOME 2-DA-09. Refine computational models based on the data they have generated. (P5.3, P4.4)

<b>LEVEL</b>	<b>CST A.2.</b>	<b>Level 2 (Ages 11-14)</b>
<b>STRAND / COURSE</b>	<b>2-AP.</b>	<b>Algorithms &amp; Programming</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Variables</b>

LEARNING OUTCOME 2-AP-11. Create clearly named variables that represent different data types and perform operations on their values. (P5.1, P5.2)

<b>LEVEL</b>	<b>CST A.2.</b>	<b>Level 2 (Ages 11-14)</b>
<b>STRAND / COURSE</b>	<b>2-AP.</b>	<b>Algorithms &amp; Programming</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Control</b>

LEARNING OUTCOME 2-AP-12. Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. (P5.1, P5.2)

<b>LEVEL</b>	<b>CST A.2.</b>	<b>Level 2 (Ages 11-14)</b>
<b>STRAND / COURSE</b>	<b>2-AP.</b>	<b>Algorithms &amp; Programming</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Modularity</b>

LEARNING OUTCOME 2-AP-13. Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2)

<b>LEVEL</b>	<b>CST A.2.</b>	<b>Level 2 (Ages 11-14)</b>
<b>STRAND / COURSE</b>	<b>2-AP.</b>	<b>Algorithms &amp; Programming</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Program Development</b>

LEARNING  
OUTCOME

2-AP-18. Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. (P2.2)

<b>LEVEL</b>	<b>CST A.2.</b>	<b>Level 2 (Ages 11-14)</b>
<b>STRAND / COURSE</b>	<b>2-IC.</b>	<b>Impacts of Computing</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Social Interactions</b>

LEARNING  
OUTCOME

2-IC-22. Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2)

<b>LEVEL</b>	<b>CST A.2.</b>	<b>Level 2 (Ages 11-14)</b>
<b>STRAND / COURSE</b>	<b>2-IC.</b>	<b>Impacts of Computing</b>
<b>LEARNING OUTCOME / STRAND</b>		<b>Safety, Law, &amp; Ethics</b>

LEARNING  
OUTCOME

2-IC-23. Describe tradeoffs between allowing information to be public and keeping information private and secure. (P7.2)