ENGLISH LANGUAGE ARTS

Students in grades eleven and twelve will continue to build on the literary progression of previous grades by reading and comprehending increasingly complex texts. They will be able to recognize various accounts of a subject told in multiple forms, expanding their reasoning to include what each version stressed or called attention to and how that influenced the account. Students will be able to distinguish between “strong evidence” and insufficient or unreliable details as they read text. At this level, reading will include a study of world literature as well as reading and evaluating influential U.S. documents.

Required writing by students in grades eleven and twelve will include argumentative papers that support their analysis of a text or topic, using enough relevant evidence to legitimately support their claim(s); informative texts that examine and communicate complex ideas, concepts, or information clearly and accurately; and narratives containing a progression of events that build upon each other. All writing products will reflect a strong command of grammar and usage.

The following grade-specific standards define what students should understand and be able to do by the end of the year to progress towards college and career readiness in each major area.

## Reading: Literature

### Key Ideas and Details

1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
2. Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.
3. Analyze the impact of the author’s choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).

### Craft and Structure

4. Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)
5. Analyze how an author’s choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.
6. Analyze a case in which grasping a point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).

### Integration of Knowledge and Ideas

7. Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.)
8. (Not applicable to literature)
9. Demonstrate knowledge of eighteenth-, nineteenth-, and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics.

### Range of Reading and Level of Text Complexity

10. By the end of grade 11, read and comprehend literature, including stories, dramas, and poems, in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range.

By the end of grade 12, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 11–CCR text complexity band independently and proficiently.
Reading: Informational Text

Key Ideas and Details
1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
2. Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.
3. Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.

Craft and Structure
4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
5. Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.
6. Determine an author’s point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.

Integration of Knowledge and Ideas
7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.
8. Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).
9. Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln’s Second Inaugural Address) for their themes, purposes, and rhetorical features.

Range of Reading and Level of Text Complexity
10. By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range.

By the end of grade 12, read and comprehend literary nonfiction at the high end of the grade 11–CCR text complexity band independently and proficiently.
1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

   a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence.

   b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases.

   c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

   d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

   e. Provide a concluding statement or section that follows from and supports the argument presented.

2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

   a. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

   b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

   c. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.

   d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.

   e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

   f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
<table>
<thead>
<tr>
<th>3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.</th>
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<tbody>
<tr>
<td>a. Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.</td>
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<tr>
<td>b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.</td>
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<tr>
<td>c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution).</td>
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<tr>
<td>d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.</td>
</tr>
<tr>
<td>e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.</td>
</tr>
</tbody>
</table>

| 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3.) |
| 5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| 6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |

| 7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| 8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| 9. Draw evidence from literary or informational texts to support analysis, reflection, and research. |
| a. Apply grades 11–12 Reading standards to literature (e.g., “Demonstrate knowledge of eighteenth-, nineteenth-, and early twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics”). |
| b. Apply grades 11–12 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning [e.g., in U.S. Supreme Court case majority opinions and dissents] and the premises, purposes, and arguments in works of public advocacy [e.g., The Federalist, presidential addresses]”). |

| 10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes. |
Speaking and Listening

1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.

2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

3. Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.

4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

6. Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.
Language

Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
   a. Apply the understanding that usage is a matter of convention, can change over time, and is sometimes contested.
   b. Resolve issues of complex or contested usage, consulting references (e.g., Merriam-Webster's Dictionary of English Usage, Garner's Modern American Usage) as needed.

2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
   a. Observe hyphenation conventions.
   b. Spell correctly.

Knowledge of Language

3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
   a. Vary syntax for effect, consulting references (e.g., Tufte’s Artful Sentences) for guidance as needed; apply an understanding of syntax to the study of complex texts when reading.

Vocabulary Acquisition and Use

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies.
   a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word’s position or function in a sentence) as a clue to the meaning of a word or phrase.
   b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).
   c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage.
   d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
   a. Interpret figures of speech (e.g., hyperbole, paradox) in context and analyze their role in the text.
   b. Analyze nuances in the meaning of words with similar denotations.

6. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
Summary of Key Points

For many years, scientists and researchers weren't able to examine normal, healthy brains. They only got brain data from autopsies and surgeries. Even so, they were able to learn a lot about how the brain functioned because when people suffered brain damage to parts of the brain, they could see what functions were impaired and know the parts of the brain that were responsible for that function. MRI technology has changed that because now scientists can examine healthy brains at all stages of development, including getting functional results that show areas of the brain that “light up” while performing tasks. Therefore, scientists are now able to measure how the brain works.

95% of the brain has been formed by age 6, but through MRI studies researchers now know that changes in the brain structure continue to occur late in child development. The prefrontal cortex has a growth spurt just before puberty and then prunes back in adolescence. This part of the brain is responsible for reasoning, controlling impulses, and making judgments. The growth and pruning is a very important stage of brain development, so when this second wave is happening teen’s activities can affect how their brain responds for the rest of their lives.

Researchers have found waves of growth and change in other parts of the brain as well, including the corpus callosum and the cerebellum. The corpus callosum influences language learning, and the cerebellum helps physical coordination and is also used to process mental tasks and higher thought such as math, philosophy, decision-making, etc.

This recent research has confirmed what scientists have known for many years . . . that different parts of the brain mature at different times. However, the brain is much more changeable than previously thought, with structural changes taking place into adolescence and beyond. Knowing more about the brain’s structure is only one piece of the puzzle. Much more research is needed to draw conclusions about how the brain structure and function directly cause behavior.

Conclusion:

MRI technology has enabled researchers to learn much more about the brain’s growth and development. They have learned that parts of the brain, such as the pre-frontal cortex, an area of the brain that controls reasoning and judgment, goes through a second growth spurt just before puberty, and that this helps to explain why teenagers begin to have more control over their impulses and are able to make better judgments. Additionally, scientists have been able to confirm that some brain characteristics are genetic, and others are affected by environmental factors. Confirming that different parts of the brain mature at different times and that the brain has structural changes through adolescence is very important, but there is a great deal more research that needs to be done to learn about how brain structure and function relate to behavior.
How is this article relevant to my future?

Knowing more about the brain and how it influences behavior will have a major impact on how children and teenagers are raised and educated. For example, one of the researchers, Giedd believed that the growth and pruning can happen at a time of brain development when the actions of teenagers can affect them the rest of their lives, his “use it or lose it principle.” This is the time when music or academic development could be “hardwired.” This theory puts more emphasis on parents to make sure their teens have the right focus and guidance. Most parents already believe in a basic approach to raising and educating their children, but this research could lead to a very specific timetable and a do and don’t guide to child development, making sure that their child is exposed to the appropriate factors at the right time.
Annotation

The writer of this piece

- introduces a topic.
  - For many years, scientists and researchers weren’t able to examine normal, healthy brains. They only got brain data from autopsies and surgeries. Even so, they were able to learn a lot about how the brain functioned because when people suffered brain damage to parts of the brain, they could see what functions were impaired and know the parts of the brain that were responsible for that function. MRI technology has changed that because now scientists can examine healthy brains at all stages of development, including getting functional results that show areas of the brain that “light up” while performing tasks. Therefore, scientists are now able to measure how the brain works.

- organizes complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole.
  - 95% of the brain has been formed by age 6, but through MRI studies researchers now know that changes in the brain structure continue to occur late in child development. The prefrontal cortex has a growth spurt just before puberty and then prunes back in adolescence. Researchers have found waves of growth and change in other parts of the brain as well. This recent research has confirmed what scientists have known for many years that different parts of the brain mature at different times.

- develops the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
  - Details: 95% of the brain has been formed by age 6 ...
  - Facts: The corpus callosum influences language learning, and the cerebellum helps physical coordination and is also used to process mental tasks and higher thought ...
  - Examples: They have learned that parts of the brain, such as the prefrontal cortex, ...

- uses appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.
  - For many years ... Even so ... Therefore ... other parts of the brain as well ... This recent research ... However, ... Knowing more about the brain’s structure ... Additionally, ... Confirming that different parts of the brain mature at different times and that the brain has structural changes through adolescence is very important, but ... For example ... This theory ...

- uses precise language, domain-specific vocabulary (when appropriate), and techniques such as metaphor, simile, and analogy to manage the complexity of the topic (though sometimes important concepts, notably pruning, go undefined).
  - data ... autopsies ... surgeries ... MRI technology ... prefrontal cortex ... growth spurt ... corpus callosum ... cerebellum ... puberty ...
  - This is the time when music or academic development could be “hardwired.”

- establishes and maintains a formal style and objective tone while attending to the norms and conventions of the discipline in which the student is writing.
  - For many years, scientists and researchers weren’t able to examine normal, healthy brains ... Most parents already believe in a basic approach to raising and educating their children, but this research could lead to a very specific timetable and a do and don’t guide to child development, making sure that their child is exposed to the appropriate factors at the right time.
Annotation (Continued)

• provides a concluding section that follows from and supports the information or explanations presented (e.g., articulating implications or the significance of the topic).
  ✓ Knowing more about the brain and how it influences behavior will have a major impact on how children and teenagers are raised and educated. For example, one of the researchers, Giedd believed that the growth and pruning can happen at a time of brain development when the actions of teenagers can affect them the rest of their lives, his “use it or lose it principle.” This is the time when music or academic development could be “hardwired.” This theory puts more emphasis on parents to make sure their teens have the right focus and guidance. Most parents already believe in a basic approach to raising and educating their children, but this research could lead to a very specific timetable and a do and don’t guide to child development, making sure that their child is exposed to the appropriate factors at the right time.

• demonstrates good command of the conventions of standard written English.
A high school senior wrote the essay that follows for a career and technical class. The student had unlimited time to research and write this paper.

**TIG/GTAW Welding**

Welding is a highly demanded trade across the US. There are many types of welding such as wire feed, stick, TIG (Tungsten Inert Gas), and oxy acetylene welding. I will explain the most perfected and efficient welding process of them all, TIG welding. I will take you through shielding gases, tungsten materials, tungsten shapes and shaping, heat and warp age, welding flaws, and some recommendations to prevent welding flaws.

There are many purposes for shielding gases in the welding industry. In general, shielding gases are one of the many variables throughout the TIG welding processes. There are four types of gases and they all have their own characteristics. Shielding gases protect the molten metal and the tungsten from the impurities in the air during welding. Shielding gases also have an effect on the temperature the arc produces and the physical appearance of the weld bead. Flow rates in the TIG welding processes can also affect the shielding aspects of your weld.

The four types of shielding gases throughout the TIG welding processes are: argon (Ar), helium (He), hydrogen (H), and nitrogen (N). Any of those four gases can be mixed together.

Argon is a by-product of oxygen and nitrogen. Before it was produced on a huge scale, argon was a rare gas. Since argon is denser than air, argon can shield welds in deep grooves and tight places. But since argon is denser than air, when overhead welding is necessary, flow rates need to be increased because the argon will fall from the weld. Argon is fairly easy to ionize so it makes it convenient for AC (Alternating Current) welding.

Helium is a by-product of natural gas. Helium increases your weld penetration. Helium is great for welding aged aluminum and is also great for tube mills since helium allows you to weld at higher speeds. Helium is usually mixed with argon to help the shielding aspects since helium is lighter than air. Helium is not used with the AC since it doesn’t have the cleaning aspects that argon has.

Hydrogen is not used so much as a shielding gas as much as an additive to other shielding gases. Hydrogen is used when weld penetration and speed is needed. Hydrogen is not used when welding stainless steel since hydrogen is the number one cause of porosity and cracking in mild and stainless steel.

Similar to hydrogen, nitrogen is used as an additive to argon. It also can cause porosity in some ferritic steels. Ferritic steels are defined as a group of stainless steels with a chromium content range of 12-18%. Such steels do not respond well to heat treatment or temperament.

Nitrogen is used to increase penetration when welding copper alloys. Nitrogen is also a stabilizer when welding alloys. When it comes to shielding gases it makes a big difference in your welds. There are many characteristics to consider when you weld different materials.

Continued on Next Page
Tungsten is a base material the electrode is made of. The electrode is the part of the welding torch that transfers the electrical arc to the weld material. Tungsten materials are another huge variable when it comes to TIG welding. Tungsten materials can affect your weld in similar ways as shielding gases. There are many characteristics of each material and depending upon what you are welding you may have to make some choices. Each tungsten is labeled by a color to make choosing easier.

There are five common types of tungstens including: pure tungsten (green), 1 % thorium (yellow) and 2 % thorium (red), 1/4to 1/2 % zirconium (brown), 2 % cerium (orange), 1 % lanthanum (black).

Pure tungsten has limited use for AC welding, and has the poorest heat resistance and electron flow, since there is no other material mixed with pure tungsten, it doesn’t have any of there characteristics including electron flow rates or heat resistance. Pure tungsten is mostly used for aluminum and magnesium.

Thoriated tungsten improves current flow, but to maintain an arc with thoriated tungsten requires more voltage. Thorium increases service life of the tungsten and makes arc starting easier. Thoriated tungsten do not work well with AC welding since it is hard to maintain a ball end shape, which is required for AC welding.

Zirconium tungstens help emit electrons more freely and can be used with AC and DC (Direct Current) welding processes, unlike thoriated tungstens. Unlike thoriated tungstens zirconium tungstens are not radioactive. So they have less contamination aspects than thoriated tungstens.

Cerium tungstens have many of the same characteristics as thoriated tungstens, they were actually made to replace thoriated tungstens since they are not radioactive, which makes them safer. Lithium tungstens are also non-radioactive like cerium. They are similar to thoriated tungstens, except they have a higher arc voltage.

Tungsten shaping and heat penetration are directly related to each other. When you change the thickness of the materials you are welding, you need to maybe consider changing shielding gases or tungsten types but you also need to think about the shape on the end of the tungsten especially since it changes weld penetration.

There are three basic shapes to choose from You can modify each as you learn more about all the variables you can choose from. The three basic shapes are: pointed end, rounded end, and tapered with ball end (FIGURE 1).

There are special ways to grind and shape your tungstens. When you grind your tungsten, you need to make sure you use a grinding wheel that you have never grinded with before. If you use a used grinding wheel, the tungsten may become contaminated, and eventually contaminate the metal you are welding. You also need to make sure when you grind a point on your tungsten, to grind the tungsten parallel to the grinding wheel. Grinding your tungsten parallel to the grinding wheel allows electrons to flow easier, and prevents further contamination to the tungsten. You need to make sure when grinding a pointed end tungsten that the length of the tapered part of the tungsten is twice as long as the diameter of the tungsten. Tungsten shape and shaping is another large element of TIG welding that needs to be considered to make your welds most efficient.

(figure not reprinted here)

Heat is the main reason for warpage in the welding industry. Warpage needs to be considered when welding since the shape of the material will change after applying heat. There are different ways metals warp depending on where the heat is applied and how much heat is applied. Many professional welders know
through experience how much a project will warp with different settings on the welder. They can also predict and correct warpage before it happens. Warpage can also depend on tungsten shape, tungsten material, amperage, shielding gases, weld angles and weld distances. There are also different ways metal warps depending on the weld joint.

(figure not reprinted here)

As shown in FIGURE 2, once the heat from the welding process is applied to the objects, the two arrows show which way the metal is warped. The two dots represent the weld. There are many different ways metal can warp and this shows just an idea of how the weld warps the metal.

There are many TIG welding flaws you can run into when you are not fully experienced. These flaws must be looked at, especially when people’s lives depend on it, such as in constructing bridges and buildings.

Many common welding failures are caused by welding flaws such as porosity, inclusions, inadequate penetration, and cracks, just to name a few. All of these problems can cause your weld to be weaker than you intended.

Porosity is caused when gases are dissolved in the weld, forming air bubbles in and on the weld. The result of porosity is caused by improper shielding gases or pressure settings. The shielding gases are what protect the molten metal when welding and eliminates porosity.

Inclusions are when non-metallic metals such as slag enters the molten metal. This can be caused by multiple weld starts. It can be fixed by welding one continuous bead.

Inadequate penetration can weaken the weld severely along with inclusions and porosity. When you don’t get the right amount of penetration you don’t allow the full amount of materials to fuse together. The main cause of improper penetration are a misdirected arc and not enough amperage. Simply, the weld bead is too small for the job.

Cracks are another flaw that can have drastic effects. Cracks are caused during the solidifying stages of welding. When the metals drastically drop temperature, the weld materials are vulnerable to cracking. Slowing your weld speed is one of the main corrections to cracking. When welding it is most important to ask questions if you need to since someone’s life could depend on it.

TIG welding processes can weld many more materials than wire feed of stick welding. TIG welding processes are capable of welding many types of materials such as: copper, aluminum, mild and low carbon steels, stainless steel, and magnesium. This is what makes TIG welding so different than any other welding process. You can weld so many different materials. This is where TIG welding becomes the most perfected welding process in the welding industry. The TIG welding process can weld the most materials of all the welding processes.

Some recommendations will help you perform better welds, these fall into categories like welding angles, arc distance control, tungsten types, and shielding gas considerations. TIG welding can be a lot to take in when it comes to an essay, but if you can remember different recommendations such as these you will increase your abilities to weld with a TIG welder. The first recommendation is to consider all your variables throughout the whole process, ask questions when needed and take your time. Speed will eventually come as time goes on. To clear up how the TIG welding process works check out the illustration below.

(illustration from online source not reprinted here)
Now that you know about some recommendations on how to improve your weld abilities, I will explain how to protect yourself during welding. Safety is a huge deal when it comes to welding in general. You need the proper protective equipment to make your job or experience as safe as it can be. You need to protect your eyes, skin, and lungs. You need a proper welding helmet to protect your eyes and face from the bright arc and spatter. You will also need thick gloves and a long sleeve cotton shirt to protect your skin from burning from the bright light. You should leave no skin uncovered or unprotected. Burns can lead to blindness and skin cancer. You should also have pants and steel toe boots to protect against further burns or falling objects. A respirator should be used when welding specific metals to protect your respiratory system from cancer and other damage.

Learning about TIG welding has been a very helpful experience for me since it will help me in my college career, and in my job after school. I am going to be a certified welder. This learning experience has helped me greatly. TIG welding is something that needs to be learned not only by textbook or paper but also by hands on learning. And thankfully, I have gotten that experience to weld hands on. It makes learning so much easier.

Works Cited:


The writer of this piece

- **introduces a topic.**
  - There are many types of welding . . . I will explain . . . I will take you through . . .

- **organizes ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; includes graphics when useful to aiding comprehension.**
  - I will explain the most perfected and efficient welding process of them all, TIG welding. I will take you through shielding gases, tungsten materials, tungsten shapes and shaping, heat and warp age, welding flaws, and some recommendations to prevent welding flaws.
  - There are many purposes for shielding gases in the welding industry.
  - The four types of shielding gases throughout the TIG welding process are: argon (Ar) . . .
  - Argon is a by-product of oxygen and nitrogen.

- **develops the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.**
  - Hydrogen is not used so much as a shielding gas as much as an additive to other shielding gases. Hydrogen is used when weld penetration and speed is needed. Hydrogen is not used when welding stainless steel since hydrogen is the number one cause of porosity and cracking in mild and stainless steel.
  - If you use a used grinding wheel, the tungsten may become contaminated, and eventually contaminate the metal you are welding.
  - When welding it is most important to ask questions if you need to since someone’s life could depend on it.

- **uses appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.**
  - There are special ways to grind and shape your tungstens. When you grind your tungsten, you need to make sure . . .
  - As shown in FIGURE 2, once the heat from the welding process is applied to the objects . . .
  - Inadequate penetration can weaken the weld severely along with inclusions and porosity. . . . Cracks are another flaw that can have drastic effects.

- **uses precise language and domain-specific vocabulary to manage the complexity of the topic.**
  - Similar to hydrogen, nitrogen is used as an additive to argon. It also can cause porosity in some ferritic steels. Ferritic steels are defined as a group of stainless steels with a chromium content range of 12-180.
  - Zirconium tungstens help emit electrons more freely and can be used with AC and DC (Direct Current) welding processes, unlike thoriated tungstens.

- **establishes and maintains a formal style and objective tone while attending to the norms and conventions of the discipline in which the student is writing.**
  - Now that you know about some recommendations on how to improve your weld abilities, I will explain how to protect yourself during welding.
  - Learning about TIG welding has been a very helpful experience for me since it will help me in my college career, and in my job after school. I am going to be a certified welder.

- **provides a concluding section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).**
  - Learning about TIG welding has been a very helpful experience . . . I am going to be a certified welder. . . . TIG welding is something that needs to be learned not only by textbook or paper but also by hands on learning. And thankfully, I have gotten that experience to weld hands on. It makes learning so much easier.

- **demonstrates good command of the conventions of standard written English (with occasional errors that do not interfere materially with the underlying message).**
This essay was produced in a two-hour-long college placement exam. Students first read a passage of approximately a thousand words titled "In Praise of Boredom." The passage was adapted from an essay published by Ellen Ruppel Shell in 2000. Students were then asked to respond to Shell’s views, drawing on anything else they had previously read, their observations, and/or their experiences.

**Freedom From Structure**

Children are blank slates that are subject to the environment around them. Allowing a child to interact with their surroundings is difficult for adults because it leaves each decision, and each consequence of that decision, up to them. Ellen Ruppel Shell believes that children miss out on experimenting and discovering aspects of the world that cannot be taught in a classroom or read about in a book. I agree that children can learn many important lessons about social interaction and the products of creativity by playing on their own, or with other children, in a free and open environment.

To relieve the inevitable boredom that every child eventually encounters, they can nourish their creative minds by playing alone. As a child, I was content to sometimes play by myself in a land of make-believe. If it was cold and rainy outside, I would pretend it was the middle of summer. Night became day, my bedroom became a kingdom, my bed was a castle, my floor was a mote, and I was a princess. Playing "let’s pretend" allowed me to imagine and create my own world when reality seemed too mundane. "Boredom leads to exploration, which leads to creativity,” and nothing is more creative than a world that exists in the mind of a child.

There are endless opportunities for parents to stimulate and teach their kids that come with instructions and rules and boundaries, but I agree with Shell when she declares that “the best play is spontaneous and unpredictable.” Plain and simple freedom is invaluable, and we are only so free as children. As we grow up, our minds become molded around society’s rules and we learn to conform to a certain way of thinking and creating. If adults see a soccer ball, they will only think of how to play soccer. If children see a soccer ball they will immediately create their own rules and proceed with an entirely different game. The ability to be spontaneous and imaginative is strongest in children because they know nothing else. Adults and parents that bombard their kids with structured activities are wasting the unique and innate ability of children to create; however, a parent’s reasoning for such structure is not unsupported.

There are many life lessons that can be difficult to learn on your own, so adults establish controlled environments for their children to learn about the world. For example, making new friends can be an awkward and terrifying process for kids, so parents will try to make friends for their children. What most adults don’t realize is that they are robbing their child of a chance to open up and reach out to another person. The kid they meet on the jungle gym will be more beneficial to them than the kid their parent forced them to play with. “We don’t believe that they can navigate the world, so we try to navigate it for them.” Shell believes that adults need to trust their kids to discover the world for themselves and that it’s just as important for them to fail as it is for them to succeed.

For children, it’s not about the final product, it’s how they get there. When forced to follow rules and obey boundaries, kids are not given the opportunity to use their imagination. I agree with Shell and I believe that it is more beneficial for children to make believe, be spontaneous, and discover as much as they can about the world for themselves.
The writer of this piece introduces a precise, knowledgeable claim.
✓ I agree that children can learn many important lessons about social interaction and the products of creativity by playing on their own, or with other children, in a free and open environment.

The writer of this piece establishes the significance of the claim, distinguishing the claim from alternate or opposing claims.
✓ Allowing a child to interact with their surroundings is difficult for adults because it leaves each decision, and each consequence of that decision, up to them.

The writer of this piece creates an organization that logically sequences claim, counterclaims, reasons, and evidence.
✓ I agree that children . . . they can nourish their creative minds by playing alone. . . . As a child, I was . . . but I agree with Shell when she declares . . . As we grow up . . . There are many life lessons that can be difficult to learn on your own . . . What most adults don’t realize . . . For children, it’s not about the final product . . . I agree with Shell and I believe . . .

The writer of this piece develops the claim and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both.
✓ Allowing a child to interact with their surroundings . . . leaves each decision, and each consequence of that decision, up to them.
✓ Ellen Ruppel Shell believes that children miss out on experimenting and discovering aspects of the world that cannot be taught in a classroom or read about in a book.
✓ . . . they can nourish their creative minds by playing alone.
✓ There are many life lessons that can be difficult to learn on your own, so adults establish controlled environments for their children to learn about the world.
✓ When forced to follow rules and obey boundaries, kids are not given the opportunity to use their imagination.

The writer of this piece develops the claim in a manner that anticipates the audience’s knowledge level, concerns, values, and possible biases.
✓ . . . making new friends can be an awkward and terrifying process for kids, so parents will try to make friends for their children. What most adults don’t realize is that they are robbing their child of a chance to open up and reach out to another person.

The writer of this piece uses words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim and reasons, between reasons and evidence, and between claim and counterclaims.
✓ As a child . . . As we grow up . . . For example . . .
✓ To relieve the inevitable boredom that every child eventually encounters, they can nourish their creative minds by playing alone. As a child, I was content to sometimes play by myself in a land of make-believe. . . . “Boredom leads to exploration, which leads to creativity,” and nothing is more creative than a world that exists in the mind of a child.
✓ There are endless opportunities for parents to stimulate and teach their kids that come with instructions and rules and boundaries, but I agree with Shell when she declares that “the best play is spontaneous and unpredictable.”

The writer of this piece provides a concluding statement that follows from and supports the argument presented.
✓ I agree with Shell and I believe that it is more beneficial for children to make believe, be spontaneous, and discover as much as they can about the world for themselves.

The writer of this piece demonstrates good command of the conventions of standard written English (with occasional errors that do not interfere materially with the underlying message).