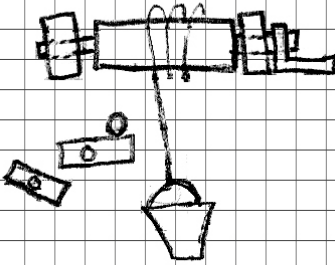
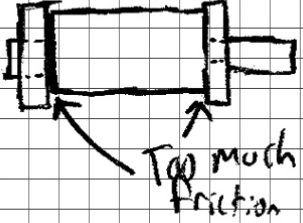
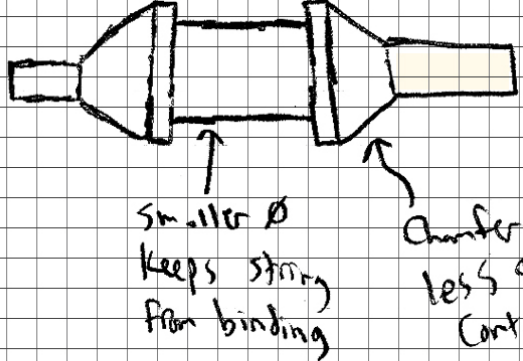
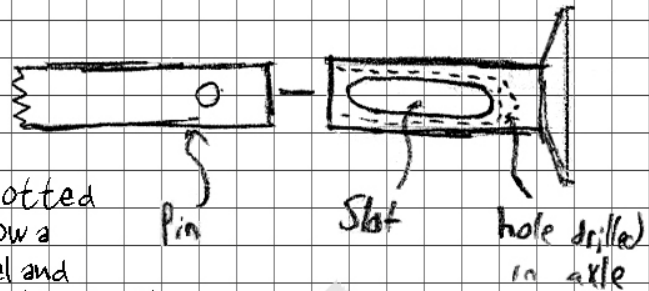


# Sample Designer Notebook Entries

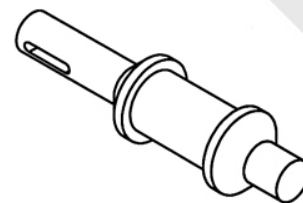
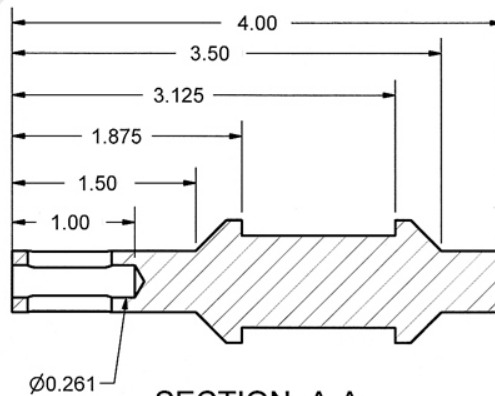
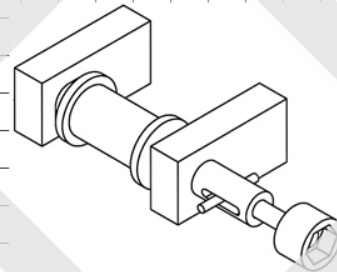
The following would be considered **excellent** examples of entries in a designer notebook.

<p><i>Continued from page 124</i></p> <p>5/13 I came up with a way to use the wheel and axle in my design. A weight falls into the bucket and causes the axle to spin. The wheel (what looks like a hand crank in this case) is attached to the axle and would also spin... hitting something and transferring its energy to the next part of the system. Now I have to figure out how to use it in my system.</p>	<div style="text-align: right;"> <p>1st Idea for a Wheel and Axle Sub-System</p> <p style="font-weight: bold; font-size: 1.2em;">125</p> </div> 
<p>My instructor let me borrow a book to help me get some ideas for my system. I found a great idea for a screw and wedge mechanism on page 194.</p> <p>Chironis, N, and Sclater, N, (1996). Mechanisms and Mechanical Devices Source-book (2nd edition). New York, NY: McGraw-Hill.</p>	
	<p>5/15 It's Sunday, and I came in at 10:00 AM to work on the project. I spent the morning modifying the wheel and axle design, because I think it is going to cause too much friction between the side walls and the bracket that will hold it in place. I also went to the other Technology Lab and found some 1" diameter aluminum bar stock to make my wheel and axle.</p>
	<p>2nd Idea Modified Wheel and Axle address potential friction issue</p>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><small>SIGNATURE</small></p> <p><i>[Signature]</i></p> <p><small>DISCLOSED TO AND UNDERSTOOD BY</small></p> <p><i>Richard Blain</i></p> </div> <div style="width: 45%;"> <p><small>DATE</small></p> <p>5-15-05</p> </div> </div>	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><small>DATE</small></p> <p>May 15, 2005</p> </div> <div style="width: 45%;"> <p><small>PROPRIETARY INFORMATION</small></p> </div> </div>	

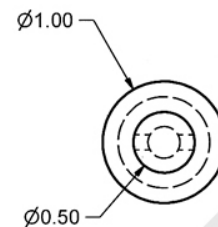
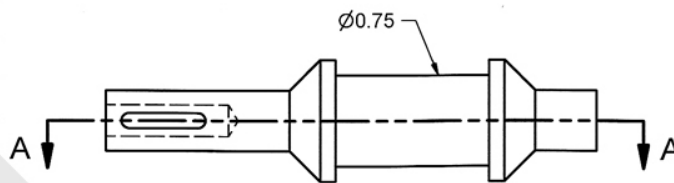
3rd Idea  
Linear Motion Allowance



5/15 (continued) I added a slotted hole to the design, which will allow a shaft to connect to the wheel and axle. As the wheel and axle spins, the shaft (which is held in place by a pin) will also spin. A spring inside the slotted hole will allow the pin (which attaches to a screw on the other end) to move linearly hence the reason for the slot. I drew up the necessary models in CADD, and assembled them to make sure they will work (in theory). I then created a dimensioned drawing of the new wheel and axle design and fabricated it on the metal lathe.



Aluminum Axle  
Scale 1:1



CADD Printouts of Assembled Sub-System and  
Technical Drawing of Wheel and Axle

Continued on page 12-7

SIGNATURE

*Richard Blair*

DATE

*May 15, 2005*

DISCLOSED TO AND UNDERSTOOD BY

*Richard Blair*

DATE

*5-15-05*

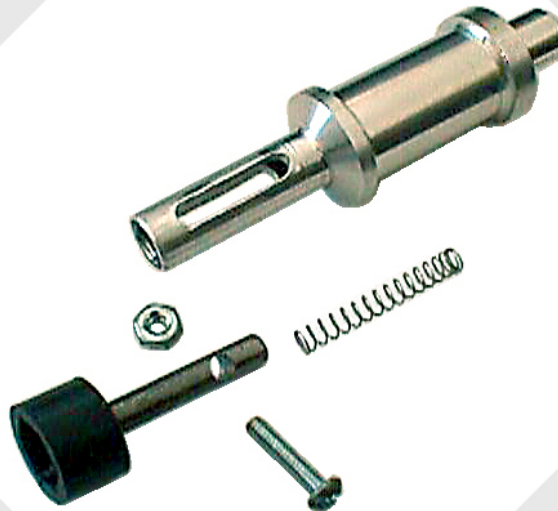
PROPRIETARY INFORMATION

Picture of Prototyped Wheel  
and Axle Sub-System

String and Bucket not shown

taken 5/17 with digital camera  
and cleaned up in Photoshop

wheel\_axle\_subsystem.jpg



5/17 I finished machining the wheel and axle, and tossed together a mock-up of an idea for the pin so that I could test the design. The spring was purchased from the local hardware store, and cost me \$0.75. My instructor gave me a bin full of scrap hardware parts to scavenge through. That's how I found the 6-32 machine screw and 5/16 nut.

Wheel and Axle Mechanical  
Advantage calculations

$r_a$  = radius of the axle

$r_w$  = radius of the wheel

MA = mechanical advantage

$$MA = \frac{r_w}{r_a}$$

$$MA = \frac{0.75}{0.5}$$

$$MA = 1.5$$

5/18 Without considering friction in the system, my wheel and axle design ~~should give~~ <sup>st</sup> should multiply the input force one and one-half times. Hopefully this will be enough to turn the screw on the other end of the pin. I think a brass weight falling into the bucket should work.

Continued on page

SIGNATURE

DATE

DISCLOSED TO AND UNDERSTOOD BY

DATE

PROPRIETARY INFORMATION

Why do the previous examples represent outstanding entries in a designer notebook?

- The pages have been sequentially numbered.
- The pages are part of a bound notebook.
- There is a dedicated location on each page for the designer's and witness's dated signatures.
- All figures and calculations have been clearly labeled.
- Inserted items have been properly attached to their respective pages.
- The date for each entry has been clearly identified.
- The designer has included annotated sketches that help the reader understand the ideas.
- The designer has provided detailed explanations of how the designs are supposed to work.
- The designer has given evidence of research.
- Problems that were encountered through experimentation have been chronicled, and ideas to fix them are clearly evident.
- A technical drawing for a prototype has been provided, which specifies the material from which the part is to be made.
- A digital photograph of the prototype has been included that suggests how the object is to be assembled.
- The information given in the entries is proportional to the amount of time given per class period.
- Any mistakes that were made have a single line drawn through them. Mistakes are initialed.

The following is an example of an **unacceptable** engineering notebook. Keep in mind that each entry represents a reflection of 75 minutes of continuous work.



9/20 Designed support bar. My partner built support. Not what I designed. Should still work.

9/22 Designed wood guide and first displacement arm.



10/11 Had to cancel on my field trip in English to work on this stupid project. Zip ties are the key. I'm sure of it.

10/12 It didn't work! We got it working once before, but not during the formal test. Rubber bands #@%\$, Inventor #@%\$. My partner is worthless!



Why does the previous example represent an unacceptable engineering notebook?

- The student submitted a sheet of loose leaf paper that was removed from a wire bound spiral notebook. An engineering notebook must be a bound document. No pages should ever be removed from an engineering notebook.
- The page number is not identified in ink.
- The student did not sign and date the page.
- Several class meetings between 9/22 and 10/11 are not represented by notebook entries.
- No sketches, CAD model graphics, or technical drawings are included to support the idea that the support bar, guide, or displacement arm was actually designed or being built. It also appears that the student was leaving room so that he/she could go back and add sketches later on in an attempt to satisfy the rubric.
- Except for wood, which encompasses a broad spectrum, no tools or materials are identified as having been used.
- The student offered no explanation as to functions of the support bar, wood guide, and displacement arm.
- The entries do not show that the partners talked about their ideas or worked on their designs as a team.
- The entries do not talk about any special considerations or problems that might have been encountered during the design of the parts.
- Only fragments of ideas have been documented. There is no detail at all.
- The student used inappropriate expletives in a formal document and was openly disrespectful to his/her teammate.
- 75 minutes of work cannot be accurately and completely summed up in one sentence.