Georgia Tech Center for Education Integrating Science, Mathematics & Computing

The Engineering Design Log: A Digital Design Journal Facilitating Learning and Assessment

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Why EDP Logs?

- Concise, scaffolded guide of student process
- Allows for self-reflection
- Used in both science and engineering classes
- Defends non-working prototypes/no artifact
- Requires instruction for usage
- Provides a gradable resource

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Engineering Notebooks

The evolution of the eEDPL

- Manage quantity (about 200 for semester)
- Intermediate submission of items
- Structure to the entries

- Paper based 3-ring binder notebooks
  - Student sabotage
  - Drop = loss of pages and organization
- Composition/Spiral Notebooks
  - Identification of owner
  - No method to insert pages

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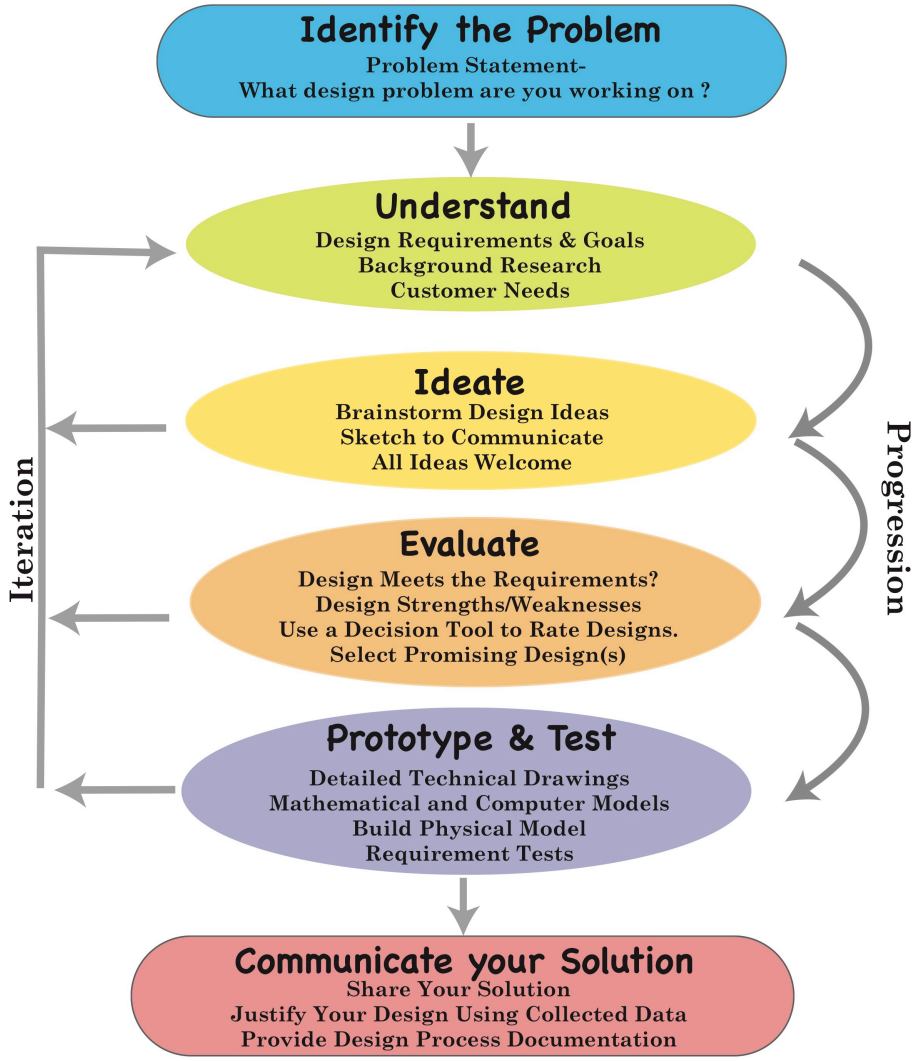
Engineering Design Process (EDP)



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The eEDP Log: electronic Engineering Design Process Log

Tabbed spreadsheet aligned with EDP

Formatted and auto-populating example

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EDP Log
Scoring and Grading

- EDPPSR (Goldberg 2011)
- Modified for both High and Middle School use
- Revised to 8 elements
- 0-5 for High School and 0-4 for Middle School
- Student checklist aligned to rubric
- *Rubric is designed for GROWTH (not as absolute scale)!*

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Teachers' Perspective

- 6 teachers varying utilization
  - Teacher led class activity
  - Student completion for each activity
- Benefits at both age groups
  - Organization and documentation skills
  - Improved understanding of EDP
  - Informed design decisions
- Challenges using EDPL
  - Student resistance
  - Student writing, reading and critical thinking skills
  - Technology disruption

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Results

EDPL Descriptive Statistics for Middle School Logs, Max Score =3, n=20

Element	Mean	SD	Range(min,max)
A: Identify the problem	0.8	0.89	(0,2)
B: Understand	0.85	0.67	(0,2)
C: Ideate	1.15	0.67	(0,2)
D: Evaluate	0.75	0.85	(0,2)
E: Prototype & Test	0.25	0.44	(0,1)
F: Iterate	0.05	0.22	(0,1)
G: Progression	0.05	0.22	(0,1)

Element H: Communicate your solution was not scored.

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Conclusions

- Use of EDP Log needs to have clear purpose and expectations for students
- Pedagogical and assessment value clear to teachers
- A separate reflective aspect needs further work
- Explicitly incorporate EDP Log use in the curricula

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Questions

- AMP-IT-UP is funded by the NSF MSP award #1238089

- www.ampitup.gatech.edu

- jeff.rosen@ceismc.gatech.edu

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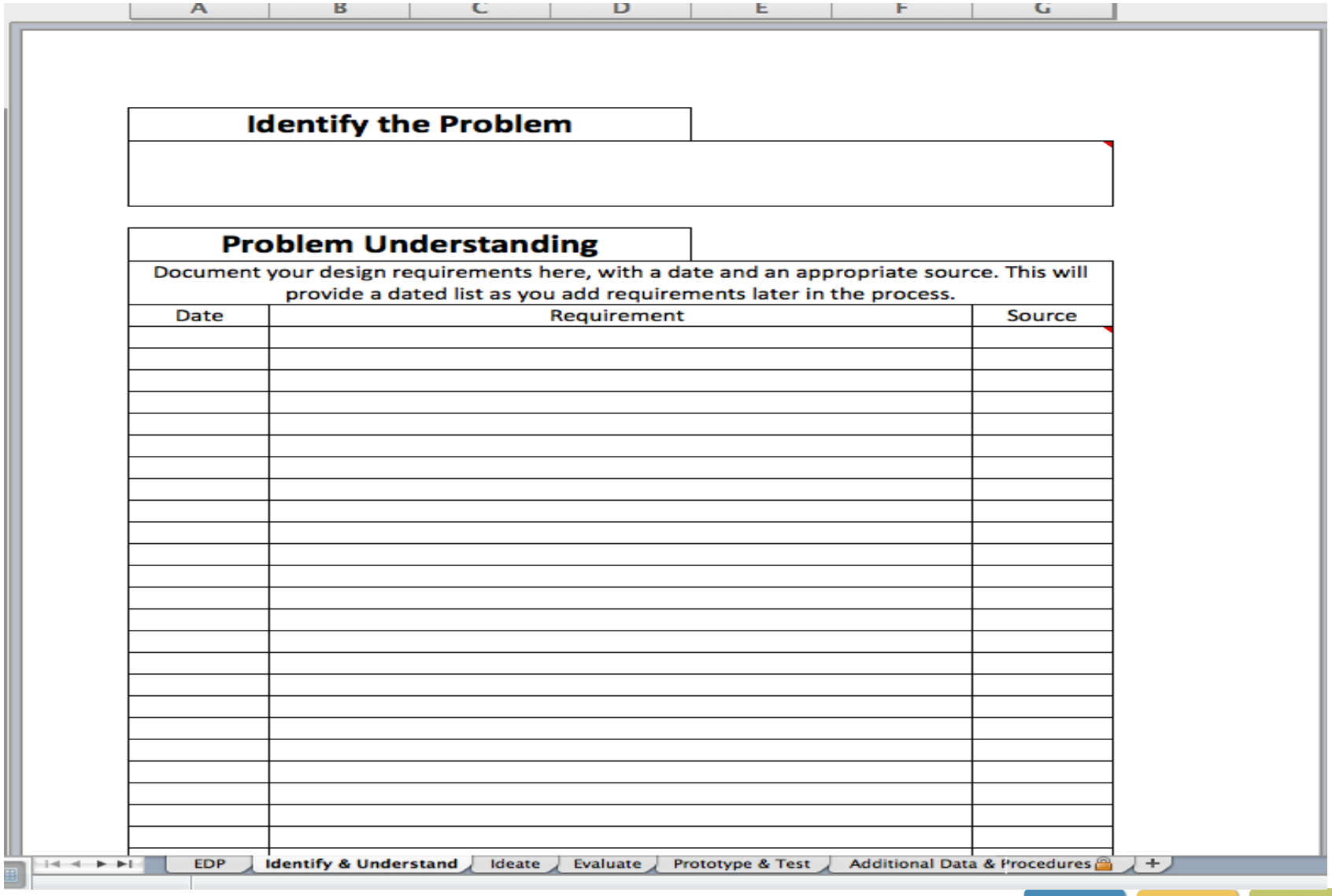

Identify the Problem

Problem Understanding

Document your design requirements here, with a date and an appropriate source. This will provide a dated list as you add requirements later in the process.

Date	Requirement	Source

EDP | Identify & Understand | Ideate | Evaluate | Prototype & Test | Additional Data & Procedures

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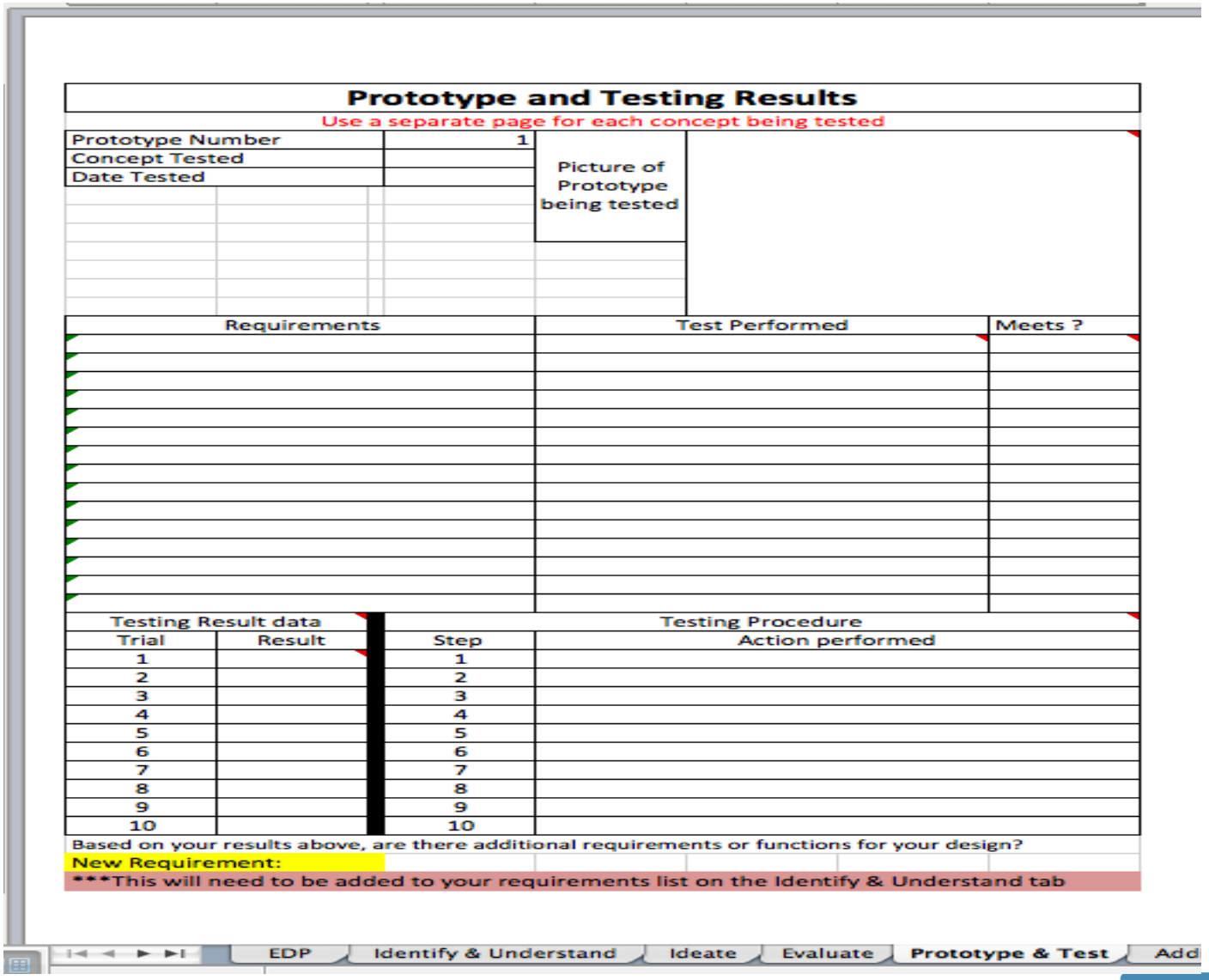

Prototype and Testing Results

Use a separate page for each concept being tested

Prototype Number	1
Concept Tested	
Date Tested	

Picture of Prototype being tested

Requirements	Test Performed	Meets ?

Testing Result data		Testing Procedure	
Trial	Result	Step	Action performed
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	

Based on your results above, are there additional requirements or functions for your design?

New Requirement:

***This will need to be added to your requirements list on the Identify & Understand tab

EDP | Identify & Understand | Ideate | Evaluate | Prototype & Test | Add

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