

18 RESEARCH PROCESS PROJECT MODELS Overview of formal & informal research models that students can use for their school career and beyond.

| RESEARCH PROCESS PROJECT MODEL | PLAN | | AGGREGATE MATERIALS & INFORMATION | | | CREATE THE PRODUCT | | EVALUATE OUTCOME | |
|---|--|---|---|---|---|---|---|--|---|
| AGOPPE Montgomery Country Schools | ASK QUESTIONS Identify problem Brainstorm topic Background knowledge | | GATHER INFORMATION Brainstorm sources Identify keywords Skim for relevant information Record notes, bibliographic info | | | ORGANIZE Analyze, interpret, evaluate, organize related to questions, create a graphic organizer of relevant information | PREPARE/PRODUCE Create a rough draft, revise & edit for content & mechanics, publish | PRESENT Present product to audience | EVALUATE Evaluate final product based on rubric, reflect on research process |
| BIG 6 Mike Eisenberg | 1. Task Definition 1.1 Define the information problem 1.2 Identify information needed | | 2. Information Seeking Strategies 2.1 Determine all possible sources 2.2 Select the best sources | 3. Location and Access 3.1 Locate sources (intellectually and physically) 3.2 Find information within sources | | 4. Use of Information 4.1 Engage (e.g., read, hear, view, touch) 4.2 Extract relevant information | 5. Synthesis 5.1 Organize from multiple sources 5.2 Present the information | 6. Evaluation 6.1 Judge the product (effectiveness) 6.2 Judge the process (efficiency) | |
| DESIGN CYCLE <i>International Baccalaureate Org.</i> | INQUIRING & ANALYZING -Explain (the problem) & justify the need -Identify & prioritize the research -Analyze existing products -Develop a design brief (how intend to solve problem; guides investigation toward design specification) | | DEVELOPING IDEAS -Develop a design specification (detailed criteria of conditions, restrictions, dimensions with which design must comply) -Develop design ideas (generate range of feasible designs that meet design specification) -Present the chosen design (justify choice against design specification) -Develop planning drawings/diagrams (materials & methods) | | | CREATING THE SOLUTION (Begin Process Journal to include in Design Folder) -Construct a logical plan (detailed, logical steps that describe efficient use of resources & time) -Demonstrate technical skills (document competent use of appropriate techniques & equipment (photo/video)) -Follow plan to make the solution -Justify changes made to the design while creating solution | | EVALUATING -Design testing methods & generate data to measure success of solution based on target audience -Evaluate success of solution vs design specification -Explain how the solution could be improved (evaluate performance at each stage of Design Cycle) -Explain the impact of the solution (on target audience: life, society and/or environment) | |
| DESIGN FLUENCY – 5 E's | ENGAGE Pique student personal interests, while assessing prior understanding. | | EXPLORE Get students involved in the topic & build understanding. | | | EXPLAIN Communicate what is learned & what it means | EXTEND Use new knowledge & explore implications | EVALUATE Determine how much learning & understanding has taken place. | |
| DESIGN THINKING <i>Jenkins, Martin, Halliday</i> | DESIGN PROBLEM | UNDERSTAND Empathize | DEFINE | | IDEATE | PROTOTYPE | TEST SOLUTION | ASSESS Evaluate product, feedback | |
| GUIDED INQUIRY DESIGN <i>Kuhlthau, Manides, Capari</i> | OPEN Invitation to inquiry Open minds Stimulate curiosity | IMMERSE Build background knowledge Connect to content Discover ideas | EXPLORE Explore interesting ideas Look around Dip in | IDENTIFY Pause and ponder Identify inquiry question Decide direction | GATHER Gather important information Go broad Go deep | CREATE Reflect on learning Go beyond facts to make meaning Create to communicate | SHARE Learn from each other Share learning Tell your story | EVALUATE Evaluate achievement of learning goals Reflect on content Reflect on process | |
| INFORMATION SEARCH W/ WRITING | Developing the task | | Choosing & locating sources | Acquiring information | | Presenting results | | Self-evaluation | |
| INQUIRY PROCESS <i>J Branch, D Oberg</i> | ASK/PLAN Pose questions Identify topic of inquiry | | INVESTIGATE Find resources Select relevant & pertinent information | | | CREATE Interpret & organize information Create product | | REFLECT/ EVALUATE Product & process | |
| INFORMATION LITERACY - 5-A's <i>Jukes</i> | ASKING Key questions to be answered | | ACCESSING -relevant information | ANALYZING -information to turn it into knowledge | | APPLYING -the information to a task | | ASSESSING -the end result & product | |

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| INFORMATION LITERACY PROCESS <i>Braxton</i> | DEFINING What is the problem I have to solve? | LOCATING Where can I find the information I need? | SELECTING How can I search these sources effectively? | INTERPRETING What is this information telling me? | ORGANIZING How can I organise my information so I understand it better? | PRESENTING How can I share this information with other people? | ASSESSING What have I learned from this? | REFLECTING How have my knowledge and understanding been confirmed, challenged or changed? | |
| I-SEARCH <i>Macrorie; Joyce & Tallman</i> | SELECTING A TOPIC What do I want to know? | | FINDING INFORMATION Where can I find the answers? | USING INFORMATION How will I record the information that I find? | DEVELOPING A FINAL PRODUCT How will I show what I learned? | | | How will I know I did a good job? | |
| LAUNCH CYCLE <i>Spencer, Juliani</i> | LOOK, LISTEN, LEARN Awareness, wonder, or empathy | ASK QUESTIONS | UNDERSTANDING THE PROCESS OR PROBLEM authentic research, conduct interviews, watch videos, or analyze data | | NAVIGATE IDEAS Apply knowledge; brainstorm, analyze or combine ideas, generate a concept | CREATE A PROTOTYPE Digital or tangible product; an action, event or system | HIGHLIGHT & Fix Revise toward success | LAUNCH TO AUTHENTIC AUDIENCE | |
| PACE <i>No Sweat Library</i> | PLAN & PREPARE | | ACCESS & ACQUIRE Selecting sources & materials | | COMBINE & CREATE Gathering & using resources | | | EVALUATE & EXPRESS Reflecting on process & product | |
| PATHWAYS to KNOWLEDGE <i>Pappas & Tepe</i> | PRESEARCH Develop an overview Connect to prior knowledge | | SEARCH Identify & select resources Seek relevant information | | INTERPRETATION | COMMUNICATION Apply information Share new knowledge | EVALUATION Process & Product | | |
| QUEST | QUESTION Challenge the boundaries & expand content knowledge | | | UNDERSTAND Analyze arguments & context | EVALUATE Multiple Perspectives & points of view | SYNTHESIZE Combine knowledge with own perspective into an argument | TEAM, TRANSFORM, TRANSMIT Collaborate, reflect & communicate to audience. | | |
| RESEARCH CYCLE <i>Jamie McKenzie</i> | QUESTIONING Start with an essential question then develop related questions to guide research | | PLANNING Identify likely sources of information & how to store findings | GATHERING Collect information that relates to questions, that is relevant & pertinent | SORTING & SIFTING Sort & sift information into categories that contribute to understanding | SYNTHESIZING Combine & rearrange information in search of patterns & clear picture to answer essential question | EVALUATING Determine what might be missing; repeat earlier stages of cycle in search of better information | REPORTING Report findings or recommendations | |
| SOLUTION FLUENCY – 6 D's <i>GDC Foundation</i> | DEFINE Define the problem: what exactly needs to be solved? | | DISCOVER Research, gather, and analyze knowledge about the problem to give the it context | | DREAM What are the possibilities and the vision for a solution | DESIGN Working out actual mechanics & techniques for solution | DELIVER Produce Publish | DEBRIEF Reflection on success & ways to improve | |
| WISER <i>C. Klatt & S. South</i> | WONDER What do I know? What do I want to find out? Prior knowledge Acquire background information Create questions for investigation Create keywords | | INVESTIGATE What resources might help? Where do I find the resources? Find resources in different formats Record information using own words | | SORT/SEQUENCE/ SYNTHESIZE Organize main & supporti ideas Connect/compare ideas from various sources Use facts to build meaning Draw conclusions | EXPRESS What is the best way to show the answer to my question? Express new knowledge & understanding Engage audience | REFLECT & CONNECT How does this connect to things I know? Do I have new questions? Am I proud of my work? | | |