Skills and Knowledge Matrix

Use the previous steps to fill in the Skills and Knowledge Matrix (S&K Matrix) for the task. The S&K Matrix is a tool that helps identify the skills and knowledge required to perform a task successfully. It can be used to develop training materials, assess training needs, and evaluate performance. The matrix is divided into steps, with each step listing the skills and knowledge needed to complete that step.

Questions Answered by the S&K Matrix

Q #1:

Based on the S&K Matrix for this task is there any prerequisite knowledge or skills individuals should have?
Yes, individuals must possess foundational competencies in: - Mathematical computation (**S1**) and formulas (**K2**) for accurate calculations - Technical data interpretation (**S2**) and platform-specific knowledge (**K3**) for sUAS operations - Critical thinking (**S3**) and attention to detail (**S4**) for precise execution - Documentation standards (**K5**) and technical documentation skills (**S9**) for interoperability - Unit conversion proficiency (**K4**) for standardized calculations

These prerequisites align with the Problem Statement's emphasis on standardized calculation methods and interoperability with partner forces.

Q #2:

Based on this S&K Matrix is there anything that should become its own learning objective?
Yes, separate learning objectives should be established for:

1. Core Calculation Competencies:
   - Mathematical formulas and computation (skills **S1**, **S5**; knowledge **K2**)
   - Technical documentation and standards (skill **S9**; knowledge **K5**)
   - Critical thinking and analysis (skill **S3**; knowledge **K24**)
2. Platform-Specific Skills:
   - Technical data interpretation (skill **S2**; knowledge **K3**)
   - Environmental data processing (skills **S7**, **S8**; knowledge **K6**, **K7**)
   - Vector physics applications (skills **S12**, **S13**; knowledge **K12**, **K19**)
3. Operational Integration:
   - Risk assessment and security (skill **S15**; knowledge **K21**, **K22**)
   - Contingency planning (skill **S19**; knowledge **K25**)
   - Strategic decision-making (skill **S18**; knowledge **K24**)

This structure supports the Problem Statement's focus on standardized methods, interoperability, and operational effectiveness.

Q #3:

Based on this S&K Matrix is there anything that should be removed from the learning objectives?
No, all identified knowledge and skill elements are essential for ensuring: 1. Technical accuracy in sUAS leaflet dissemination calculations 2. Operational safety and security in contested environments 3. Interoperability with partner forces through standardized methods 4. Mission effectiveness in achieving MISO objectives

The high reference counts for critical elements like attention to detail (**S4**), technical documentation (**S9**), and platform-specific knowledge (**K3**) validate their importance in addressing the Problem Statement's identified gaps.

Task: Determine and Select Appropriate Aircraft Platform

Task Number: 0001

Skills and Knowledge Matrix

Skills	Knowledge
S2: Technical data interpretation	**K3:** sUAS platform-specific performance characteristics
S15: Risk assessment	**K21:** Operational security considerations
S16: Constraint analysis	**K22:** Terrain effects on sUAS operations
S17: Adaptive planning	**K23:** Airspace control measures

Task: Define Mission and Target Requirements

Task Number: 0002

Skills and Knowledge Matrix

Skills	Knowledge
S3: Critical thinking and analysis	**K17:** Target area characteristics
S18: Strategic decision-making	**K18:** Mission objectives and constraints
S19: Contingency planning	**K25:** Contingency planning principles

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Task: Review Mission Briefing and Objectives

Task Number: 0003

Skills and Knowledge Matrix

Skills	Knowledge
S3: Critical thinking and analysis	**K18:** Mission objectives and constraints
S4: Attention to detail	**K24:** Mission success criteria
S10: Organized data retrieval	**K17:** Target area characteristics

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Task: Determine Target Area Parameters

Task Number: 0004

Skills and Knowledge Matrix

Skills	Knowledge
S12: Spatial analysis	**K17:** Target area characteristics
S14: Coordinate plotting	**K19:** Coordinate systems and mapping concepts
S16: Constraint analysis	**K22:** Terrain effects on sUAS operations

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Task: Gather sUAS Performance Data and Environmental Inputs

Task Number: 0005

Skills and Knowledge Matrix

Skills	Knowledge
S2: Technical data interpretation	**K3:** sUAS platform-specific performance characteristics
S7: Environmental data interpretation	**K6:** Effects of temperature, pressure, and humidity on aerial delivery
S10: Organized data retrieval	**K8:** Real-time data integration methodology

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Task: Retrieve sUAS Technical Specifications

Task Number: 0006

Skills and Knowledge Matrix

Skills	Knowledge
S2: Technical data interpretation	**K3:** sUAS platform-specific performance characteristics
S4: Attention to detail	**K5:** Documentation requirements and standards
S10: Organized data retrieval	**K13:** Aerodynamic properties of sUAS

Task: Collect Real-Time Environmental Data

Task Number: 0007

Skills and Knowledge Matrix

Skills	Knowledge
S7: Environmental data interpretation	**K6:** Effects of temperature, pressure, and humidity on aerial delivery
S8: Adjustment factor application	**K7:** Environmental adjustment principles
S10: Organized data retrieval	**K8:** Real-time data integration methodology

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Task: Calculate Descent Time Using sUAS Parameters

Task Number: 0008

Skills and Knowledge Matrix

Step 1: Gather Altitude and Descent Rate Data

Skills	Knowledge
S1: Mathematical computation skills	**K1:** Physics principles of aerial delivery
S2: Technical data interpretation	**K2:** Mathematical formulas for time calculation
S3: Critical thinking and analysis	**K3:** sUAS platform-specific performance characteristics

Skills	Knowledge
S4: Attention to detail	**K4:** Unit conversion standards and procedures

Step 2: Apply Descent Time Formula

Skills	Knowledge
S1: Mathematical computation skills	**K2:** Mathematical formulas for time calculation
S4: Attention to detail	**K4:** Unit conversion standards and procedures
S5: Formula application	**K5:** Documentation requirements and standards
S6: Systematic calculation methodology	

Step 3: Adjust for Environmental Factors

Skills	Knowledge
S3: Critical thinking and analysis	**K6:** Effects of temperature, pressure, and humidity on aerial delivery
S7: Environmental data interpretation	**K7:** Environmental adjustment principles
S8: Adjustment factor application	**K8:** Real-time data integration methodology

Step 4: Validate and Document Final Calculation

Skills	Knowledge
S3: Critical thinking and analysis	**K5:** Documentation requirements and standards
S4: Attention to detail	**K9:** Expected ranges for descent time values
S9: Technical documentation	**K10:** Validation methodologies

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Task: Calculate Forward Drift with sUAS Airspeed

Task Number: 0009

Skills and Knowledge Matrix

Step 1: Gather Required Input Parameters

Skills	Knowledge
S2: Technical data interpretation	**K3:** sUAS platform-specific performance characteristics
S4: Attention to detail	**K4:** Unit conversion standards and procedures
S10: Organized data retrieval	**K11:** Forward drift calculation methodology

Step 2: Apply Forward Drift Formula

Skills	Knowledge
S1: Mathematical computation skills	**K2:** Mathematical formulas for time calculation
S5: Formula application	**K11:** Forward drift calculation methodology
S6: Systematic calculation methodology	**K12:** Basics of vector physics

Skills	Knowledge

Step 3: Adjust for Platform-Specific Factors

Skills	Knowledge
S2: Technical data interpretation	**K3:** sUAS platform-specific performance characteristics
S8: Adjustment factor application	**K13:** Aerodynamic properties of sUAS
S3: Critical thinking and analysis	**K14:** Methods for applying adjustment factors

Step 4: Validate and Document Final Forward Drift Calculation

Skills	Knowledge
S4: Attention to detail	**K10:** Validation methodologies
S11: Data validation	**K5:** Documentation standards
S9: Technical documentation	**K15:** Expected forward drift ranges

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Task: Determine Optimal Release Point

Task Number: 0014

Skills and Knowledge Matrix

Step 1: Gather All Calculated Parameters

Skills	Knowledge
S10: Organized data retrieval	**K16:** Relationship between drift, dispersion, and release point
S12: Spatial analysis	**K17:** Target area characteristics
S6: Systematic calculation methodology	**K18:** Mission objectives and constraints

Step 2: Calculate Release Point Coordinates

Skills	Knowledge
S12: Spatial analysis	**K12:** Vector physics principles
S13: Vector calculation	**K19:** Coordinate systems and mapping concepts
S14: Coordinate plotting	**K20:** Techniques for calculating release points

Step 3: Adjust for Operational Constraints

Skills	Knowledge
S15: Risk assessment	**K21:** Operational security considerations
S16: Constraint analysis	**K22:** Terrain effects on sUAS operations
S17: Adaptive planning	**K23:** Airspace control measures

Step 4: Validate Final Release Point

Skills	Knowledge
S3: Critical thinking and analysis	**K24:** Mission success criteria
S18: Strategic decision-making	**K10:** Validation methodologies
S19: Contingency planning	**K25:** Contingency planning principles

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Task: Calculate Lateral Wind Drift with Sensor Data

Task Number: 0010

Skills and Knowledge Matrix

Skills	Knowledge
S1: Mathematical computation skills	**K2:** Mathematical formulas for time calculation
S7: Environmental data interpretation	**K6:** Effects of temperature, pressure, and humidity on aerial delivery
S8: Adjustment factor application	**K7:** Environmental adjustment principles
S12: Spatial analysis	**K12:** Basics of vector physics

Task: Calculate Total Drift Distance

Task Number: 0011

Skills and Knowledge Matrix

Skills	Knowledge
S1: Mathematical computation skills	**K2:** Mathematical formulas for time calculation
S5: Formula application	**K11:** Forward drift calculation methodology
S6: Systematic calculation methodology	**K12:** Basics of vector physics
S12: Spatial analysis	**K16:** Relationship between drift, dispersion, and release point

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Task: Calculate Dispersion Ellipse Dimensions

Task Number: 0012

Skills and Knowledge Matrix

Skills	Knowledge
S1: Mathematical computation skills	**K2:** Mathematical formulas for time calculation
S5: Formula application	**K11:** Forward drift calculation methodology
S6: Systematic calculation methodology	**K12:** Basics of vector physics
S12: Spatial analysis	**K16:** Relationship between drift, dispersion, and release point

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Task: Calculate Leaflet Density and Distribution

Task Number: 0013

Skills and Knowledge Matrix

Skills	Knowledge
S1: Mathematical computation skills	**K2:** Mathematical formulas for time calculation
S4: Attention to detail	**K15:** Expected forward drift ranges
S6: Systematic calculation methodology	**K16:** Relationship between drift, dispersion, and release point
S12: Spatial analysis	**K17:** Target area characteristics

Task: Validate and Refine Calculations

Task Number: 0015

Skills and Knowledge Matrix

Skills	Knowledge
S3: Critical thinking and analysis	**K10:** Validation methodologies
S4: Attention to detail	**K5:** Documentation requirements and standards
S11: Data validation	**K9:** Expected ranges for descent time values
S9: Technical documentation	**K15:** Expected forward drift ranges

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Task: Integrate Calculations into Flight Plan

Task Number: 0016

Skills and Knowledge Matrix

Skills	Knowledge
S3: Critical thinking and analysis	**K5:** Documentation requirements and standards
S6: Systematic calculation methodology	**K16:** Relationship between drift, dispersion, and release point
S9: Technical documentation	**K24:** Mission success criteria
S18: Strategic decision-making	**K25:** Contingency planning principles

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Task: Conduct Operational Review

Task Number: 0017

Skills and Knowledge Matrix

Skills	Knowledge
S3: Critical thinking and analysis	**K5:** Documentation requirements and standards
S15: Risk assessment	**K21:** Operational security considerations

Skills	Knowledge
S18: Strategic decision-making	**K24:** Mission success criteria
S19: Contingency planning	**K25:** Contingency planning principles

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Task: Document and Secure Approvals

Task Number: 0018

Skills and Knowledge Matrix

Skills	Knowledge
S4: Attention to detail	**K5:** Documentation requirements and standards
S9: Technical documentation	**K24:** Mission success criteria

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Task: Develop Product Action Worksheet

Task Number: 0019

Skills and Knowledge Matrix

Skills	Knowledge
S4: Attention to detail	**K5:** Documentation requirements and standards
S9: Technical documentation	**K24:** Mission success criteria
S10: Organized data retrieval	**K17:** Target area characteristics

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Task: Adapt MISO Products for sUAS Delivery

Task Number: 0020

Skills and Knowledge Matrix

Skills	Knowledge
S2: Technical data interpretation	**K3:** sUAS platform-specific performance characteristics
S4: Attention to detail	**K5:** Documentation requirements and standards
S9: Technical documentation	**K24:** Mission success criteria

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Comprehensive List of Knowledge and Skill Elements

Knowledge Elements (Sorted by Number of References)

Referenced 5 Times: - **K2:** Mathematical formulas for time calculation
- **K3:** sUAS platform-specific performance characteristics
- **K5:** Documentation requirements and standards
- **K24:** Mission success criteria

Referenced 4 Times: - **K12:** Basics of vector physics
- **K16:** Relationship between drift, dispersion, and release point
- **K17:** Target area characteristics

Referenced 3 Times: - **K6:** Effects of temperature, pressure, and humidity on aerial delivery
- **K7:** Environmental adjustment principles
- **K10:** Validation methodologies
- **K25:** Contingency planning principles

Referenced 2 Times: - **K1:** Physics principles of aerial delivery
- **K4:** Unit conversion standards and procedures
- **K8:** Real-time data integration methodology
- **K9:** Expected ranges for descent time values
- **K11:** Forward drift calculation methodology
- **K15:** Expected forward drift ranges
- **K18:** Mission objectives and constraints
- **K19:** Coordinate systems and mapping concepts
- **K21:** Operational security considerations
- **K22:** Terrain effects on sUAS operations

Referenced 1 Time: - **K13:** Aerodynamic properties of sUAS
- **K14:** Methods for applying adjustment factors
- **K20:** Techniques for calculating release points
- **K23:** Airspace control measures

Skill Elements (Sorted by Number of References)

Referenced 7 Times: - **S4:** Attention to detail

Referenced 6 Times: - **S3:** Critical thinking and analysis

Referenced 5 Times: - **S2:** Technical data interpretation
- **S9:** Technical documentation

Referenced 4 Times: - **S1:** Mathematical computation skills
- **S6:** Systematic calculation methodology
- **S10:** Organized data retrieval
- **S12:** Spatial analysis

Referenced 3 Times: - **S5:** Formula application
- **S8:** Adjustment factor application
- **S18:** Strategic decision-making
- **S19:** Contingency planning

Referenced 2 Times: - **S7:** Environmental data interpretation
- **S11:** Data validation
- **S15:** Risk assessment
- **S16:** Constraint analysis

Referenced 1 Time: - **S13:** Vector calculation
- **S14:** Coordinate plotting
- **S17:** Adaptive planning