DatalytIQs Academy

Cambridge IGCSE ICT 0417

Printable teaching, practice and revision companion

Independent learning resource aligned to the current Cambridge syllabus. This material is original DatalytIQs Academy content and is not endorsed by Cambridge International Education.

Contents and use

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How to study

Study the concept, reproduce the worked method, complete the practical task without copying, answer the examination-style questions, mark with the guidance and record corrections.

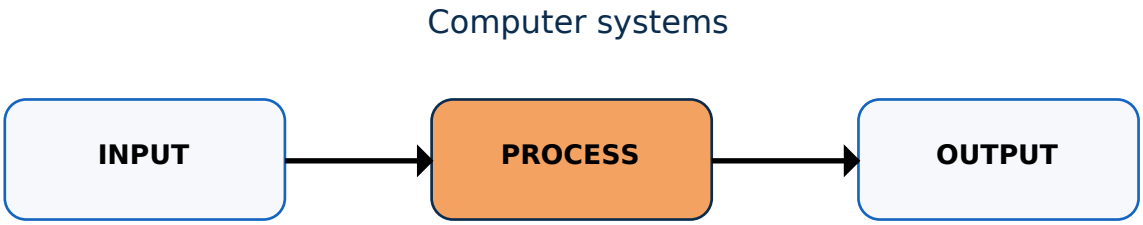
1. Computer systems

Learning outcomes

Explain the principles of Computer systems; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Computer systems should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
```

For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Computer systems. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

DatalytIQs marking guidance

Award credit for accurate knowledge, explicit explanation, relevant application and supported evaluation. A high-level response uses the scenario throughout, shows working, distinguishes facts from assumptions and qualifies its conclusion. Brand names alone do not demonstrate understanding.

Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Computer systems, complete the worked method with new data, identify a limitation and justify an improvement.

2. Input and output

Learning outcomes

Explain the principles of Input and output; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Input and output should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.

Input and output

Validate inputs - apply rules - verify outputs

Worked application

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Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Input and output. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Input and output, complete the worked method with new data, identify a limitation and justify an improvement.

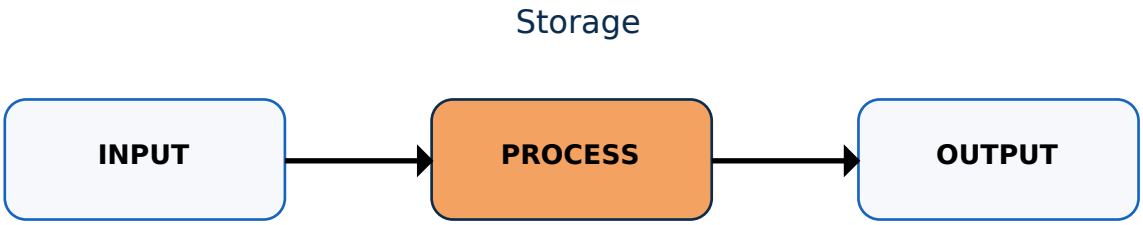
3. Storage

Learning outcomes

Explain the principles of Storage; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Storage should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

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Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Storage. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Storage, complete the worked method with new data, identify a limitation and justify an improvement.

4. Networks

Learning outcomes

Explain the principles of Networks; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Networks should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.

Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Networks. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Networks, complete the worked method with new data, identify a limitation and justify an improvement.

5. Effects of IT

Learning outcomes

Explain the principles of Effects of IT; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Effects of IT should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.

Validate inputs - apply rules - verify outputs

Worked application

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Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Effects of IT. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Effects of IT, complete the worked method with new data, identify a limitation and justify an improvement.

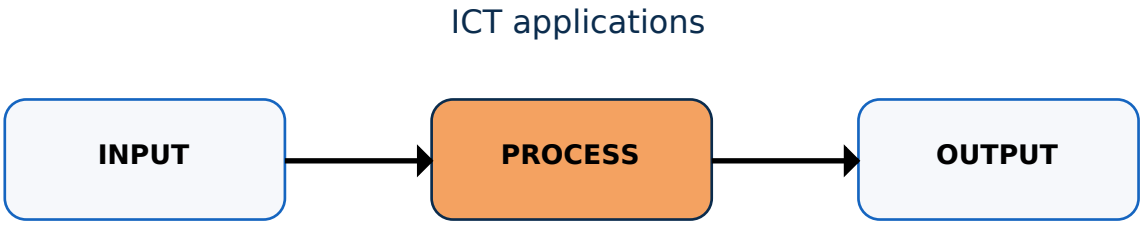
6. ICT applications

Learning outcomes

Explain the principles of ICT applications; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

ICT applications should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in ICT applications. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain ICT applications, complete the worked method with new data, identify a limitation and justify an improvement.

7. Systems life cycle

Learning outcomes

Explain the principles of Systems life cycle; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Systems life cycle should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.

Systems life cycle

Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
```

For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Systems life cycle. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Systems life cycle, complete the worked method with new data, identify a limitation and justify an improvement.

8. Safety and security

Learning outcomes

Explain the principles of Safety and security; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Safety and security should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.

Safety and security

Validate inputs - apply rules - verify outputs

Worked application

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Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Safety and security. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Safety and security, complete the worked method with new data, identify a limitation and justify an improvement.

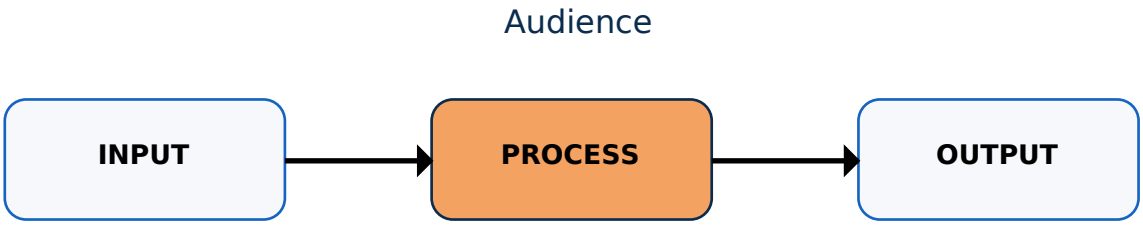
9. Audience

Learning outcomes

Explain the principles of Audience; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Audience should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Audience. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Audience, complete the worked method with new data, identify a limitation and justify an improvement.

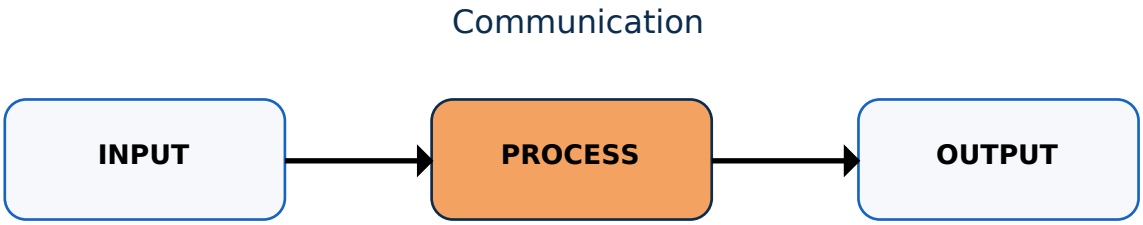
10. Communication

Learning outcomes

Explain the principles of Communication; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Communication should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Communication. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Communication, complete the worked method with new data, identify a limitation and justify an improvement.

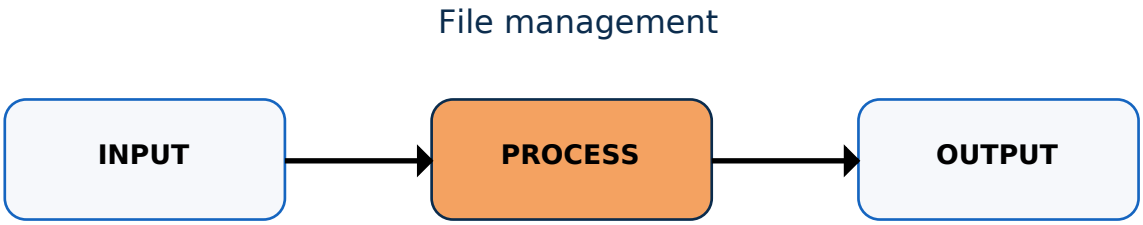
11. File management

Learning outcomes

Explain the principles of File management; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

File management should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in File management. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain File management, complete the worked method with new data, identify a limitation and justify an improvement.

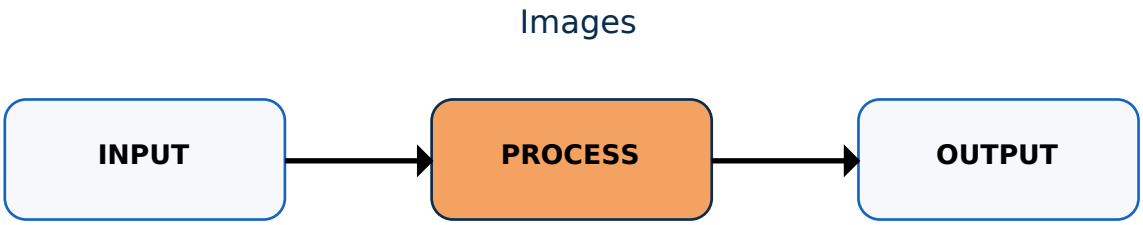
12. Images

Learning outcomes

Explain the principles of Images; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Images should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
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For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Images. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Images, complete the worked method with new data, identify a limitation and justify an improvement.

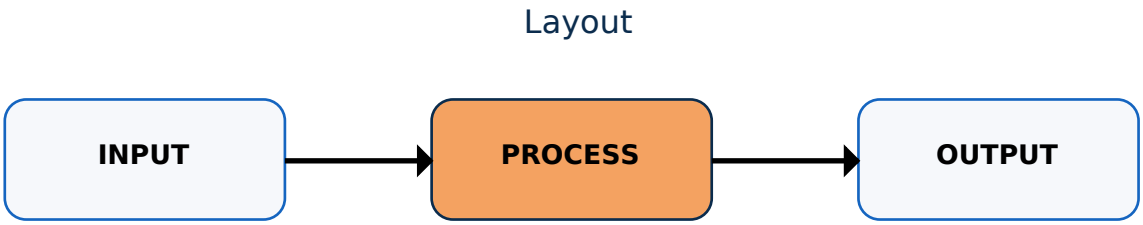
13. Layout

Learning outcomes

Explain the principles of Layout; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Layout should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
```

For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Layout. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Layout, complete the worked method with new data, identify a limitation and justify an improvement.

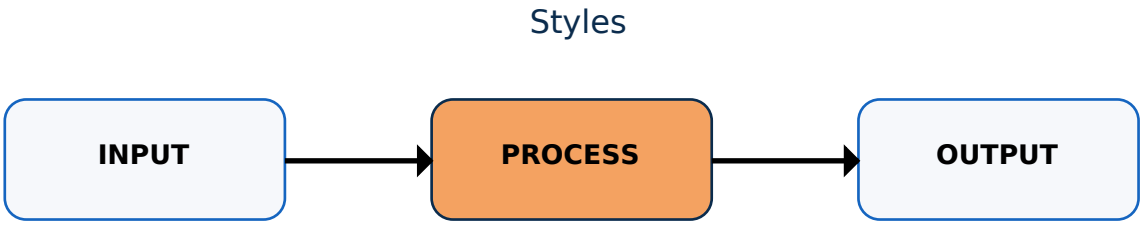
14. Styles

Learning outcomes

Explain the principles of Styles; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Styles should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
```

For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Styles. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

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Common errors

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Revision checkpoint

Without notes, explain Styles, complete the worked method with new data, identify a limitation and justify an improvement.

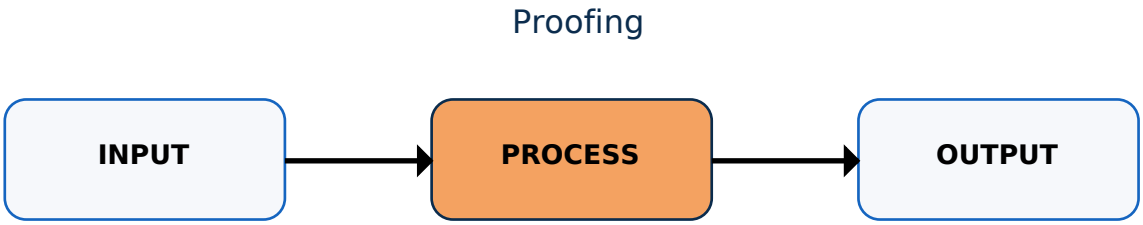
15. Proofing

Learning outcomes

Explain the principles of Proofing; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Proofing should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
```

For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Proofing. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

DatalytIQs marking guidance

Award credit for accurate knowledge, explicit explanation, relevant application and supported evaluation. A high-level response uses the scenario throughout, shows working, distinguishes facts from assumptions and qualifies its conclusion. Brand names alone do not demonstrate understanding.

Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Proofing, complete the worked method with new data, identify a limitation and justify an improvement.

16. Charts

Learning outcomes

Explain the principles of Charts; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Charts should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.

Validate inputs - apply rules - verify outputs

Worked spreadsheet model

```
Revenue: =SUM(B2:B13)
Growth: =(B13-B2)/B2
Forecast: =$F$2*(1+$F$3)^A2
Status: =IF(B2>=$F$4,"Target met","Review")
```

Use absolute references for assumptions and relative references for repeated records. Test zero growth, negative growth and an unusually large input. A chart should communicate the trend without decorative distortion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Charts. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

DatalytIQs marking guidance

Award credit for accurate knowledge, explicit explanation, relevant application and supported evaluation. A high-level response uses the scenario throughout, shows working, distinguishes facts from assumptions and qualifies its conclusion. Brand names alone do not demonstrate understanding.

Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Charts, complete the worked method with new data, identify a limitation and justify an improvement.

17. Document production

Learning outcomes

Explain the principles of Document production; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Document production should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.

Document production

Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
```

For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Document production. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

DatalytIQs marking guidance

Award credit for accurate knowledge, explicit explanation, relevant application and supported evaluation. A high-level response uses the scenario throughout, shows working, distinguishes facts from assumptions and qualifies its conclusion. Brand names alone do not demonstrate understanding.

Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Document production, complete the worked method with new data, identify a limitation and justify an improvement.

18. Databases

Learning outcomes

Explain the principles of Databases; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Databases should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.

Validate inputs - apply rules - verify outputs

Worked SQL example

```
SELECT county, COUNT(*) AS learners,
       ROUND(AVG(score), 1) AS mean_score
FROM results
WHERE score BETWEEN 0 AND 100
GROUP BY county
ORDER BY mean_score DESC;
```

The filter protects the analysis from impossible marks. Grouping produces one record per county; aggregation calculates participation and performance. Primary keys prevent duplicate records and foreign keys preserve relationships.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Databases. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

DatalytIQs marking guidance

Award credit for accurate knowledge, explicit explanation, relevant application and supported evaluation. A high-level response uses the scenario throughout, shows working, distinguishes facts from assumptions and qualifies its conclusion. Brand names alone do not demonstrate understanding.

Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Databases, complete the worked method with new data, identify a limitation and justify an improvement.

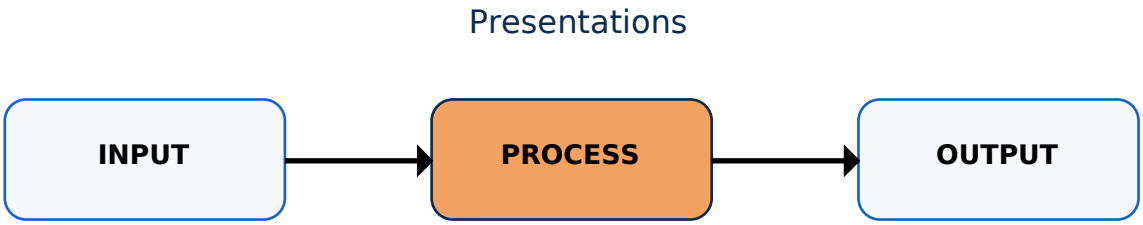
19. Presentations

Learning outcomes

Explain the principles of Presentations; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Presentations should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
```

For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Presentations. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

DatalytIQs marking guidance

Award credit for accurate knowledge, explicit explanation, relevant application and supported evaluation. A high-level response uses the scenario throughout, shows working, distinguishes facts from assumptions and qualifies its conclusion. Brand names alone do not demonstrate understanding.

Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Presentations, complete the worked method with new data, identify a limitation and justify an improvement.

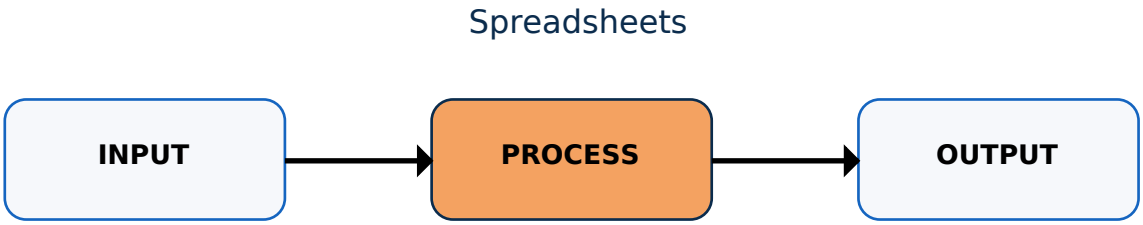
20. Spreadsheets

Learning outcomes

Explain the principles of Spreadsheets; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Spreadsheets should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked spreadsheet model

```
Revenue: =SUM(B2:B13)
Growth: =(B13-B2)/B2
Forecast: =$F$2*(1+$F$3)^A2
Status: =IF(B2>=$F$4,"Target met","Review")
```

Use absolute references for assumptions and relative references for repeated records. Test zero growth, negative growth and an unusually large input. A chart should communicate the trend without decorative distortion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Spreadsheets. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

DatalytIQs marking guidance

Award credit for accurate knowledge, explicit explanation, relevant application and supported evaluation. A high-level response uses the scenario throughout, shows working, distinguishes facts from assumptions and qualifies its conclusion. Brand names alone do not demonstrate understanding.

Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Spreadsheets, complete the worked method with new data, identify a limitation and justify an improvement.

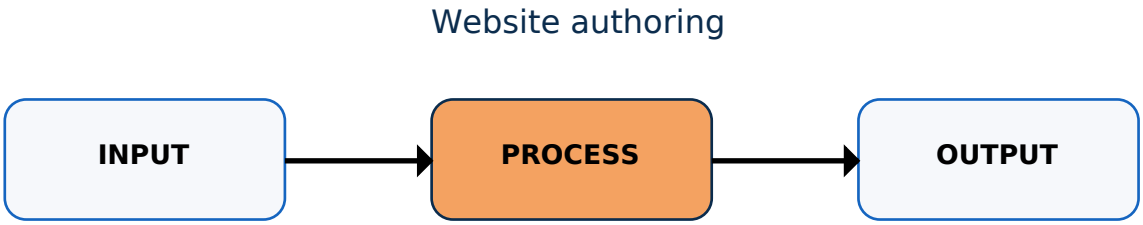
21. Website authoring

Learning outcomes

Explain the principles of Website authoring; apply them to an unfamiliar context; select and justify an appropriate method; test or verify the result; and evaluate limitations.

Concept development

Website authoring should be understood as part of a complete information system rather than as an isolated definition. Identify purpose, users, inputs, processing rules, outputs and controls. Explain causal links and compare alternatives using suitability, accuracy, efficiency, reliability, security, accessibility, cost and ethical implications.



Validate inputs - apply rules - verify outputs

Worked application

```
Requirement -> suitable input -> controlled processing -> verified output -> evaluation
```

For a county service register, specify mandatory identifiers, validate dates and categories, restrict access by role, log changes, back up records, and test recovery. Evaluate usability, accuracy, security, cost and inclusion.

Practical activity

Use the supplied practical pack. Define the requirement, prepare or import the data, implement the solution, capture evidence of tests, interpret the output and evaluate one improvement. Use normal, boundary and erroneous test data where applicable.

Examination practice

1. Define two essential terms in Website authoring. 2. Explain one mechanism using a linked cause-and-effect chain. 3. Apply the concept to a Kenyan school, health facility or enterprise. 4. Construct or annotate an appropriate diagram, algorithm, model or workflow. 5. Evaluate a proposed solution and reach a justified conclusion.

DatalytIQs marking guidance

Award credit for accurate knowledge, explicit explanation, relevant application and supported evaluation. A high-level response uses the scenario throughout, shows working, distinguishes facts from assumptions and qualifies its conclusion. Brand names alone do not demonstrate understanding.

Common errors

Listing points without explanation; confusing validation with verification; ignoring units or data types; omitting boundary tests; describing features without linking them to the requirement; and giving an absolute conclusion where suitability depends on context.

Revision checkpoint

Without notes, explain Website authoring, complete the worked method with new data, identify a limitation and justify an improvement.