# Eastern Cape Education

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| **LESSON PLAN: Technology Grade 9** |
| Name of School: |  | Term 2 | Week 1 |
| Name of Teacher(s): |  |  |
| **Focus**  | Investigation skills, Mechanical systems and control |
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 **CLASSROOM ACTIVITIES**

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| **Periods** | Content, concepts and skills | Teacher’s Activities | Learners’ Activities | Type of Assessment | Resources | Link |
| 1 | 1. **INTRODUCING THE PRACTICAL TASK:** Integrated Systems Duration of this lesson is one 30-minute period.Systems where mechanical, electrical, hydraulic or pneumatic systems are combined.Scenario: Describe a scenario where a machine combining at least two of the following sub-systems can be effective in giving a mechanical advantage to make work easier: mechanical, electrical or pneumatic/hydraulic systems.Note: The mechanical elements may consist of one or more of the following mechanisms: levers, linked levers, wheels, cams, cranks, pulleys and/or gears.The machine may include a mechanical or electrical control device like a cleat, ratchet and pawl, or switch. | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-08.html<https://www.mst> workbooks.co.za/technology.co.za |
| 2 | **2. Investigate** the situation so that an appropriate machine can be designed to solve the problem, need or want given in the scenario. Investigate the possible mechanisms and controls to be used together to make the machine | 1 Facilitates2. Guides3. Assists4. Demonstrate5.Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-07.html<https://www.mst> workbooks.co.za/technology.co.za |
| 3 | **3. Revise**: syringe mechanics using two equal sized syringes linked by a tube. Force transfer between the syringes filled with: -- Compressed air – pneumatic system. -- Water – hydraulic system.**Action research**: learners’ experiment with two different sizes of syringes linked by a tube and filled with hydraulic fluid (water). Learners **experience** force transfer with either force multiplication or force division (depending on which syringe is the driver/master).Gases (like air) are compressible. Liquids (like water, oils) are incompressible. | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-05.html<https://www.mst> workbooks.co.za/technology.co.za |
| 4 | 4. Action research:Pascal’s principle – pressure exerted on one part of a hydraulic system will be transferred equally, without any loss, in all directions to other parts of the system. Note that equal volumes of liquid are moved through the systems, and this results in different extensions (amount of movement) where syringes (cylinders) are of different sizes, so lessdistance/more force (MA > 1); and more distance/less force (MA < 1). | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal | Sasol Inzalo TextbookCAPS Document | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-06.html<https://www.mst> workbooks.co.za/technology.co.za |
| **CLASSROOM ACTIVITIES** |
| **How are you going to include and differentiate Support for learners?** |
| Teacher Activities | Learner Activities: | **Resources** |
| It will be necessary to take learners through concepts and ideas. Ask relevant questions to help them understand and interpret this information. Teach the specific meaning of all terms. Be aware of the different meanings and specific words may have (e.g., the word ‘stage’ can mean a period of time, a platform, a performance, a robbery) | Actively participate with questions, where possible practical examples, etc | Sasol inzalo Textbook Gr 9CAPS-Tech Glossary |
| **How are you going to include and differentiate Expanded opportunities for learners?** |
| Teacher Activities | Learner Activities: |
| Allocate learner more responsibility: actions / activities / leadership roles, etcAppoint learner as a mentor to another learner | Apply roles as appointed.Apply the Buddy System |



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| **LESSON PLAN: Technology Grade 9** |
| Name of School: |  | Term 2 | Week 2 |
| Name of Teacher(s): |  |  |
| **Focus**  | Investigation Skills, Evaluation skills, Design skills |
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 **CLASSROOM ACTIVITIES**

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| **Periods** | Content, concepts and skills | Teacher’s Activities | Learners’ Activities | Type of Assessment | Resources | Link |
| 1 | **1 + 2: Evaluate**: learners examine various items using mechanisms found in the modern kitchen and/or home, workshop/garage. Items like can openers, egg beaters, ‘strap’ spanners for opening bottles, knives for a range of purposes, and vice grip, wire strippers and ratchet spanners should be evaluated in terms of: Who is it for? What is it for? Will it do the job? What material is it made of? Is the material suitable? What should it cost? Does it look good? Is it safe and easy to use? They report on three items and pawl, or switch. | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-08.html<https://www.mst> workbooks.co.za/technology.co.za |
| 2 | **1 + 2: Evaluate**: learners examine various items using mechanisms found in the modern kitchen and/or home, workshop/garage. Items like can openers, egg beaters, ‘strap’ spanners for opening bottles, knives for a range of purposes, and vice grip, wire strippers and ratchet spanners should be evaluated in terms of: Who is it for? What is it for? Will it do the job? What material is it made of? Is the material suitable? What should it cost? Does it look good? Is it safe and easy to use? They report on three items | 1 Facilitates2. Guides3. Assists4. Demonstrate5.Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | https://youtu.be/fvOmaf2GfCY  |
| 3 | **3 + 4: Investigation:** Design considerations ~ fit-for-purpose:-- Evaluate the design of the hydraulic jack in terms of:Who is it for? What is it for? Will it do the job? What should it be made of? What should it cost? Is it cost-effective? Does it look good (aesthetics)? Is it safe/easy to use for the end user (ergonomics)? | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | <https://youtu.be/U15hZ22wFtg> |
| 4 | **3 + 4: Investigation:** Design considerations ~ fit-for-purpose:-- Evaluate the design of the hydraulic jack in terms of:Who is it for? What is it for? Will it do the job? What should it be made of? What should it cost? Is it cost-effective? Does it look good (aesthetics)? Is it safe/easy to use for the end user (ergonomics)? | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo TextbookCAPS Document | <https://youtu.be/HISCnOesufk> |
| **CLASSROOM ACTIVITIES** |
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| Teacher Activities | Learner Activities: | **Resources** |
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| **How are you going to include and differentiate Expanded opportunities for learners?** |
| Teacher Activities | Learner Activities: |
| Allocate learner more responsibility: actions / activities / leadership roles, etcAppoint learner as a mentor to another learner | Apply roles as appointed.Apply the Buddy System |



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| **LESSON PLAN: Technology Grade 9** |
| Name of School: |  | Term 2 | Week 3 |
| Name of Teacher(s): |  |  |
| **Focus**  | Mechanical systems and control, Communication Skills |
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 **CLASSROOM ACTIVITIES**

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| **Periods** | Content, concepts and skills | Teacher’s Activities | Learners’ Activities | Type of Assessment | Resources | Link |
| 1 | 1. Lead learners as they **revise** the interactions of the following:-- Spur gears of equal size counter-rotating.-- Spur gears of unequal size counter-rotating – note velocity/force relationships.-- Spur gears using an idler to synchronise rotation. | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-08.html<https://www.mst> workbooks.co.za/technology.co.za |
| 2 | **2.** . Lead learners as they find out about the interactions of the following:-- Bevel gears of equal size – axis of rotation 90o.-- Bevel gears of unequal size – axis of rotation 90o – note velocity/force relationships.-- Rack-and-pinion gear system as found on automatic gates and steering racks.-- Worm gear system for large reduction in speed and increase in force | 1 Facilitates2. Guides3. Assists4. Demonstrate5.Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-07.html<https://www.mst> workbooks.co.za/technology.co.za |
| 3 | 3 + 4:  **Artistic Drawing**: single vanishing point perspective.-- Learners draw a 3D wooden object using single VP perspective. They enhance the drawing showing the texture of the wood grain, colour and shadows.-- Learners use single VP perspective to draw an inside view of the classroom. | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-05.html<https://www.mst> workbooks.co.za/technology.co.za |
| 4 | 3 + 4:  **Artistic Drawing**: single vanishing point perspective.-- Learners draw a 3D wooden object using single VP perspective. They enhance the drawing showing the texture of the wood grain, colour and shadows.-- Learners use single VP perspective to draw an inside view of the classroom.distance/more force (MA > 1); and more distance/less force (MA < 1). | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo TextbookCAPS Document | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-06.html<https://www.mst> workbooks.co.za/technology.co.za |
| **CLASSROOM ACTIVITIES** |
| **How are you going to include and differentiate Support for learners?** |
| Teacher Activities | Learner Activities: | **Resources** |
| It will be necessary to take learners through concepts and ideas. Ask relevant questions to help them understand and interpret this information. Teach the specific meaning of all terms. Be aware of the different meanings and specific words may have (e.g., the word ‘stage’ can mean a period of time, a platform, a performance, a robbery) | Actively participate with questions, where possible practical examples, etc | Sasol inzalo Textbook Gr 9CAPS-Tech GlossaryGuidelines for Inclusive Teaching and Learning, pg 40 |
| **How are you going to include and differentiate Expanded opportunities for learners?** |
| Teacher Activities | Learner Activities: |
| Allocate learner more responsibility: actions / activities / leadership roles, etcAppoint learner as a mentor to another learner | Apply roles as appointed.Apply the Buddy System Guidelines for Inclusive Teaching and Learning,  pg57 |



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| **LESSON PLAN: Technology Grade 9** |
| Name of School: |  | Term 2 | Week 4 |
| Name of Teacher(s): |  |  |
| **Focus**  | Mechanical systems and control, Communication Skills |
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 **CLASSROOM ACTIVITIES**

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| **Periods** | Content, concepts and skills | Teacher’s Activities | Learners’ Activities | Type of Assessment | Resources | Link |
| 1 | 1 - 4:  **Plan: working drawings**The teams collaborate to produce drawings for their model/prototype using first angle orthographic projection. Each team member draws a plan of the design OR, if it is very complex, one or more aspects of the design. Each learner must demonstrate her/his competency in using this drawing technique. | Facilitates:1. Working drawings of chosen ideas.2. Guides learners by asking questions and focusing their attention on the working drawing. | Participates:1. each learner draws the plan (or an aspect of the plan) using first angle orthographic projection with suitable scale, correct line types and dimensions | Informal: Part of Presentation Portfolio  | Sasol Inzalo TextbookCAPS pg 11,12,30,48,50 | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-08.html<https://www.mst> workbooks.co.za/technology.co.za |
| 2 |  |  | Participates:1. each learner draws the plan (or an aspect of the plan) using first angle orthographic projection with suitable scale, correct line types and dimensions | Informal: Part of Presentation Portfolio  | Sasol Inzalo TextbookCAPS pg 11,12,30,48,50 | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-07.html<https://www.mst> workbooks.co.za/technology.co.za |
| 3 |  |  |  | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-05.html<https://www.mst> workbooks.co.za/technology.co.za |
| 4 |  | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo TextbookCAPS Document | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-06.html<https://www.mst> workbooks.co.za/technology.co.za |
| **CLASSROOM ACTIVITIES** |
| **How are you going to include and differentiate Support for learners?** |
| Teacher Activities | Learner Activities: | **Resources** |
| Simplify the project by making it require fewersteps and allowing more time for completion. The teacher may begin the project for the learner and then allow the learner to complete it. Encourage the learner to use both hands. Group tasks and peer support may help the learner with the constructing of the project. Allow the learner to work with less accuracy. Make use of buddy assist. | Actively participate with questions, where possible practical examples, etc | Sasol inzalo Textbook Gr 9CAPS-Tech GlossaryGuidelines for Inclusive Teaching and Learning, pg 40 |
| **How are you going to include and differentiate Expanded opportunities for learners?** |
| Teacher Activities | Learner Activities: |
| Allocate learner more responsibility: actions / activities / leadership roles, etcAppoint learner as a mentor to another learner | Apply roles as appointed.Apply the Buddy System Guidelines for Inclusive Teaching and Learning,  pg57 |



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| **LESSON PLAN: Technology Grade 9** |
| Name of School: |  | Term 2 | Week 5 - 6 |
| Name of Teacher(s): |  |  |
| **Focus**  | Mechanical systems and control, Communication Skills |
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 **CLASSROOM ACTIVITIES**

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| **Periods** | Content, concepts and skills | Teacher’s Activities | Learners’ Activities | Type of Assessment | Resources | Link |
| 1 | Make: prototype/working modelLearners use safe working practices.Building: the model must showcase a viable solution to the problem. It should be to scale and neat, and show intelligent use of available materials | Guides and assists:1. Provides materials where necessary.2. Assists and guides groups with the building of models.3. Ensure safe working practices. | Participation:1. Actively participates in construction and making of model.2. Applies safe working practices3. Constant evaluation of model to ensure correctness | Formal: Making of the model | Sasol Inzalo TextbookCAPS pg 44, 48, 50, 58 | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-08.html<https://www.mst> workbooks.co.za/technology.co.za |
| 2 |  |  |  |  |  | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-07.html<https://www.mst> workbooks.co.za/technology.co.za |
| 3 |  |  |  | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-05.html<https://www.mst> workbooks.co.za/technology.co.za |
| 4 |  | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo TextbookCAPS Document | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-06.html<https://www.mst> workbooks.co.za/technology.co.za |
| **CLASSROOM ACTIVITIES** |
| **How are you going to include and differentiate Support for learners?** |
| Teacher Activities | Learner Activities: | **Resources** |
| Simplify the project by making it require fewer steps and allowing more time for completion. The teacher may begin the project for the learner and then allow the learner to complete it. Encourage the learner to use both hands. Group tasks and peer support may help the learner with the constructing of the project. Visual cues to guide the learner through the sequential steps, where an example of the completed project is shown, will be of great value. Make use of the help of a peer to guide the learner through the steps. | 1. Use pictures to complete task/project2. Can complete less difficult parts of the project3. Be assigned a specific role in the group.4. Actively assists the group in making the model | Sasol inzalo Textbook Gr 9CAPS-Tech pg 44, 48, 50Guidelines for Inclusive Teaching and Learning, pg 40 |
| **How are you going to include and differentiate Expanded opportunities for learners?** |
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| **LESSON PLAN: Technology Grade 9** |
| Name of School: |  | Term 2 | Week 7 |
| Name of Teacher(s): |  |  |
| **Focus**  | Mechanical systems and control, Communication Skills |
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 **CLASSROOM ACTIVITIES**

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| **Periods** | Content, concepts and skills | Teacher’s Activities | Learners’ Activities | Type of Assessment | Resources | Link |
| 1 & 2 | * Examine the relationship between load, effort and the distance from the pivot/fulcrum.
* Investigate and demonstrate practical models of levers and linkages.
* Demonstrate mechanical advantage quantitatively and qualitatively (calculations) on levers and linkages and gears.
* Conduct an action research on pneumatics and hydraulics.

Conduct an action research on fixed and movable pulleys | * Introduce the scenario of the PAT.
* Explain what is going to be expected in the PAT.
* Explain that the PAT is Formal Assessment and all the aspects that are going to be expected in the PAT.
* Instruct all learners to create a glossary of technology terms at the back of their exercise book.
* Give information sheet to all learners on simple mechanisms.
* Give Grade - specific work sheets for learners to work on.
 | * Work in groups. Responds to questions from the teacher and peers.
* Revise pneumatics and hydraulics.
* Conduct action research: Pascal’s principle. (hydraulic jack)
* Pulleys - fixed and movable.
 | Informal  | Sasol Inzalo TextbookExercise books, worksheets and gears, syringes, clear plastic tubes, pulleys and water tub and a suitable liquid. | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-08.html<https://www.mst> workbooks.co.za/technology.co.za  |
| Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-07.html<https://www.mst>  |
| 3 | 3 + 4:  **Artistic Drawing**: single vanishing point perspective.-- Learners draw a 3D wooden object using single VP perspective. They enhance the drawing showing the texture of the wood grain, colour and shadows.-- Learners use single VP perspective to draw an inside view of the classroom. | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal/formal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-05.html<https://www.mst> workbooks.co.za/technology.co.za |
| 4 | 3 + 4:  **Artistic Drawing**: single vanishing point perspective.-- Learners draw a 3D wooden object using single VP perspective. They enhance the drawing showing the texture of the wood grain, colour and shadows.-- Learners use single VP perspective to draw an inside view of the classroom.distance/more force (MA > 1); and more distance/less force (MA < 1). | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal/ Formal  | Sasol Inzalo TextbookCAPS Document | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-06.html<https://www.mst> workbooks.co.za/technology.co.za |
| **CLASSROOM ACTIVITIES** |
| **How are you going to include and differentiate Support for learners?** |
| Teacher Activities | Learner Activities: | **Resources** |
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| **LESSON PLAN: Technology Grade 9** |
| Name of School: |  | Term 2 | Week 8 |
| Name of Teacher(s): |  |  |
| **Focus**  | Mechanical systems and control, Communication Skills |
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 **CLASSROOM ACTIVITIES**

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| **Periods** | Content, concepts and skills | Teacher’s Activities | Learners’ Activities | Type of Assessment | Resources | Link |
| 1 | **Team presentations**:Each team is given five minutes to present their solution in the form of sketches, artistic impressions of the solution, working drawings/plans, costing and their model. | Facilitates:1. Presentation of solution | Participates:1. Presentation of solution | Formal: Presentation Skills | Sasol Inzalo TextbookCAPS pg 44, 48, 50, 58 | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-08.html<https://www.mst> workbooks.co.za/technology.co.za |
| 2 |  |  |  |  |  | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-07.html<https://www.mst> workbooks.co.za/technology.co.za |
| 3 |  |  |  | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-05.html<https://www.mst> workbooks.co.za/technology.co.za |
| 4 |  | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo TextbookCAPS Document | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-06.html<https://www.mst> workbooks.co.za/technology.co.za |
| **CLASSROOM ACTIVITIES** |
| **How are you going to include and differentiate Support for learners?** |
| Teacher Activities | Learner Activities: | **Resources** |
| Teach the specific meaning of all terms and take learners through the concepts and ideas. Be aware of the different meanings a specific word may have (e.g., the word ‘stage’ can mean aperiod of time, a platform, a performance, a robbery)Provide good guidelines in order to sequence the project in a structured way. Take learners through the assignment and make use of visual cues. Make sure the learners understand the project planning steps. |  Visual cues to guide the learner through the sequential steps, where an example of the completed project is shown, will be of great value | Sasol inzalo Textbook Gr 9CAPS-Tech pg 30Guidelines for Inclusive Teaching and Learning, pg 40 |
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| Name of Teacher(s): |  |  |
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 **CLASSROOM ACTIVITIES**

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| **Periods** | Content, concepts and skills | Teacher’s Activities | Learners’ Activities | Type of Assessment | Resources | Link |
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| 2 |  |  |  |  |  | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-07.html<https://www.mst> workbooks.co.za/technology.co.za |
| 3 |  |  |  | Informal  | Sasol Inzalo Textbook | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-05.html<https://www.mst> workbooks.co.za/technology.co.za |
| 4 |  | 1 Facilitates2. Guides3. Assists4. Demonstrate 5. Provides resources | 1. Participates2. Complete tasks3. Make notes 4. Active involvement | Informal  | Sasol Inzalo TextbookCAPS Document | <https://www.mst> workbooks.co.za/technology/gr9/gr9-technonology-06.html<https://www.mst> workbooks.co.za/technology.co.za |
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| **How are you going to include and differentiate Expanded opportunities for learners?** |
| Teacher Activities | Learner Activities: |
| Allocate learner more responsibility: actions / activities / leadership roles, etcAppoint learner as a mentor to another learner | Apply roles as appointed.Apply the Buddy System Guidelines for Inclusive Teaching and Learning,  pg57 |