



**basic education**

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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

# **MECHANICAL TECHNOLOGY (WELDING AND METALWORK)**

## **GUIDELINES FOR PRACTICAL ASSESSMENT TASKS**

**GRADE 12**

**2020**

**These guidelines consist of 23 pages.**

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## 1. INTRODUCTION/BACKGROUND

The 17 Curriculum and Assessment Policy Statements subjects which contain a practical component all include a practical assessment task (PAT). These subjects are:

- **AGRICULTURE:** Agricultural Management Practices, Agricultural Technology
- **ARTS:** Dance Studies, Design, Dramatic Arts, Music, Visual Arts
- **SCIENCES:** Computer Applications Technology, Information Technology, Technical Sciences
- **SERVICES:** Consumer Studies, Hospitality Studies, Tourism
- **TECHNOLOGY:** **MECHANICAL TECHNOLOGY**, Civil Technology, Electrical Technology, and Engineering Graphics and Design

A practical assessment task (PAT) mark is a compulsory component of the final promotion mark for all candidates offering subjects that have a practical component and counts 25% (100 marks) of the end-of-year examination mark. The PAT is implemented across the first three terms of the school year. This is broken down into different phases or a series of smaller activities that make up the PAT. The PAT allows for learners to be assessed on a regular basis during the school year and it also allows for the assessment of skills that cannot be assessed in a written format, e.g. test or examination. It is therefore important that schools ensure that all learners complete the practical assessment tasks within the stipulated period to ensure that learners are resulted at the end of the school year. The planning and execution of the PAT differs from subject to subject.

The PAT allows the teacher to directly and systematically observe applied competence. The PAT comprises the application/performance of the knowledge, skills and values particular to that subject and counts 25% of the total promotion/certification mark out of 400 for the subject.

The PAT is implemented across the first three terms of the school year.

Any profession requires of its members a thorough grounding in both theory and practice and MECHANICAL TECHNOLOGY is no exception. It is emphasized that the goal of the practical assessment task is to produce a skilled learner in each specialisation field. A nation's true wealth is in its manpower and education that should aim to develop the talents of a learner so that he/she can contribute to the well-being of the society by using and developing scientific and technological resources.

To prepare a learner in MECHANICAL TECHNOLOGY'S specialisation fields, one must focus on the following:

- An attitude where the learner can selectively use ideas, gather evidence and facts, to drawing logical conclusions to put them to good use creatively and with imagination;
- A capability to express ideas and information clearly by speech, writing, drawing and manufacturing and
- A willingness and capability to accept and exercise responsibility, to make decisions, and to learn by experience.

Attributes such as these cannot all be achieved in a classroom. A sound knowledge of engineering sciences is essential to equip the MECHANICAL TECHNOLOGY learner with the necessary practical capabilities for the required processes. Practical training is the application of acquiring essential skills to bridge between trade theory and practice.

Practical application in the workshop must therefore be made an interesting and challenging experience to develop the learner physically and mentally. The learner must show his/her initiative, curiosity and persistence in learning. In order to stimulate and develop self-confidence the granting of some degree of responsibility during the practical application is very important.

## **2. TEACHER GUIDELINES**

### **2.1 Administration of the PAT**

Teachers are requested to make copies of the different specialisation PAT documents. These documents need to be handed out to the learners at the beginning of the year. The Practical Assessment Task for Grade 12 is externally set, internally assessed and externally moderated.

Teachers must attach due dates for the different facets of the PAT (refer to the CAPS document). In this manner, learners can easily assess their progress. Instances where formal assessments take place, it is the responsibility of the teacher to administer assessment.

The PAT should be completed within the first three terms. The PAT should be completed under controlled conditions (refer to Mechanical Technology SPECIALISATION: CAPS Grade 10–12).

### **2.2 Assessment of PAT**

Frequent and developmental feedback is needed to ensure necessary guidance and support to the learner.

Both formal and informal assessment should be conducted to ensure that the embedded skills are developed. Informal assessment can be conducted only to monitor progress of the learner. Formal assessment should always be conducted and recorded by the teacher.

### **2.3 Moderation of PAT**

The tasks, projects, assessment criteria as well as the mark sheets must be presented to the moderator during moderation of the PAT.

The moderator should be able to call on a learner to explain and demonstrate the functions, principles and skills during the moderation purposes.

On completion the moderator will, if necessary, adjust the marks of the group up or downwards depending on the decision reached as a result of moderation.

### **2.4 Consequences of absence/non-submission of tasks.**

If a learners' practical assessment task is incomplete or unavailable with valid reason, the learner may be given three weeks before the commencement of the final end-of-year examination to submit the outstanding task. Should the learner fail to fulfill the outstanding PAT requirement, such a learner will be awarded a zero mark for that PAT component.

A learner's results are regarded as incomplete if he/she does not offer any component of the PAT task. He/She will be given another opportunity based on the decision of the head of the assessment body. Should the learner fail to fulfill the outstanding PAT requirement, the marks for these components will be omitted and the final mark for Mechanical Technology

**2.5 Declaration of Authenticity**

NAME OF THE SCHOOL:

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NAME OF LEARNER:

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(FULL NAME(S) AND SURNAME)

NAME OF TEACHER:

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I hereby declare that the project submitted for assessment is my own, original work and has not been previously submitted for moderation.

---

SIGNATURE OF CANDIDATE

---

DATE

As far as I know, the above declaration by the candidate is true and I accept that the work offered is his or her own.

---

SIGNATURE OF TEACHER

---

DATE

SCHOOL STAMP

### 3. LEARNER GUIDELINES

#### Instructions to the learner

- The practical assessment task (PAT) consists of a specialisation task in **Welding and Metalwork**. The practical work is spread over three terms, as set out in this document. (See CAPS document.)
- All tasks must be completed according to the time frames set out in each of the tasks.
- Learners are requested to actively engage in all practical assessment tasks.
- Learners who are uncooperative will receive demerits or a zero mark for that particular section of the work.
- Learners who act unsafely in the workshop and place other learners in danger, will be given additional corrective tasks to improve their safety awareness.

#### 4. WELDING AND METALWORK (SPECIFIC)

##### TASK: BUILT-IN BRAAI:

Term: 1 to 3

Starting date: January 2020

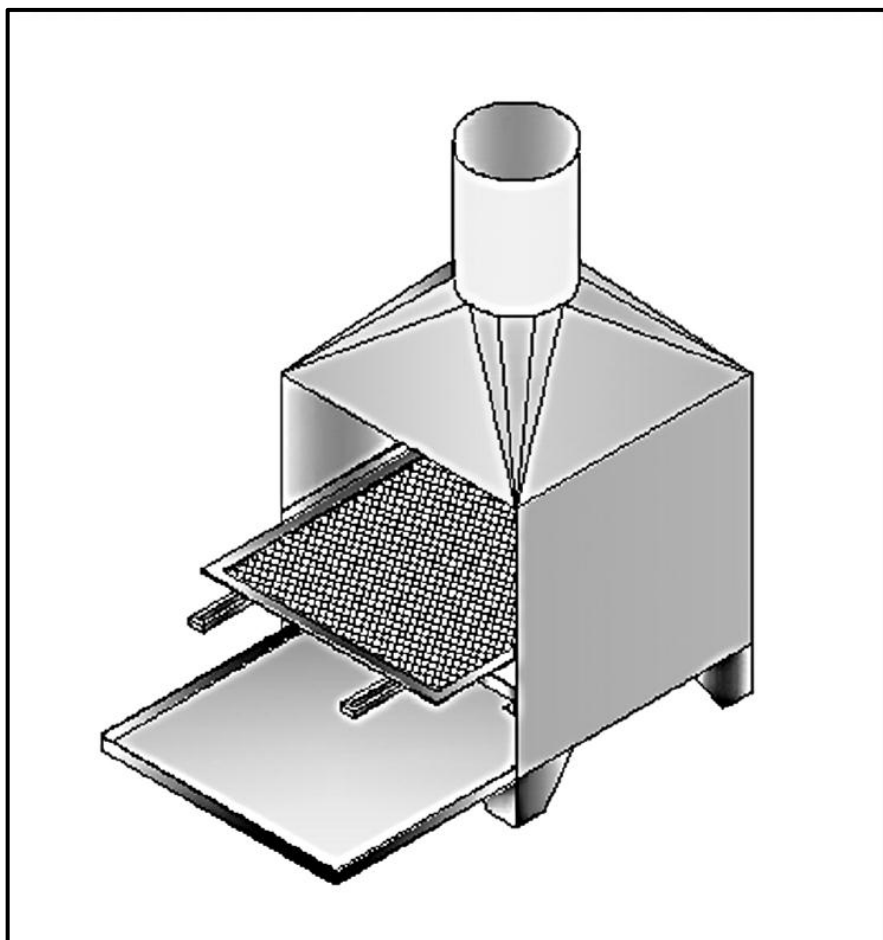
Completion date: August 2020

##### Follow the following criteria and standards:

- The design of the built-in braai is shown in the given figures.
- Dimensions can be changed according to personal requirements, but not the design. (The width, height and depth of the braai may be changed.) (Keep affordability in mind.)
- The chimney cap is according to own design. Make drawings and templates.
- Overall sizes must be within  $\pm 2$  mm of the required measurement.
- Tools and equipment must not be damaged.
- All appropriate safety procedures must be adhered to.
- All the welding must be cleaned of all slag.
- After all dimensions have been marked out, assessment according to the mark sheets must take place.
- All edges must be cleaned from all cutting burs.
- The project must be well presented.

##### RESOURCES REQUIRED FOR PAT:

COMPONENT	MATERIAL	DIMENSIONS	QUANTITY
Legs	2 mm sheet metal	200 x 50	4
Base	2 mm sheet metal	400 x 300	1
Back and sides	2 mm sheet metal	1 000 x 400	1
Grid supports	2 mm sheet metal	300 x 20	4
Ash pan (Base)	2 mm sheet metal	380 x 280	1
Ash pan (380 sides)	2 mm sheet metal	380 x 30	2
Ash pan (280 sides)	2 mm sheet metal	280 x 30	2
Grid	1,6 mm mesh	380 x 280	1
Grid frame	8 mm round bar	$\pm 1$ 400	1
Transition	1 mm sheet metal	According to template	1
Chimney (diameter = 150 mm)	1 mm sheet metal	490 x 400	1
Chimney cap	1 mm sheet metal	Own design	1





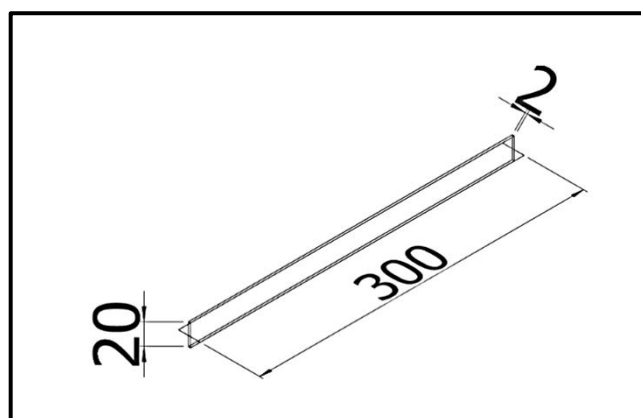
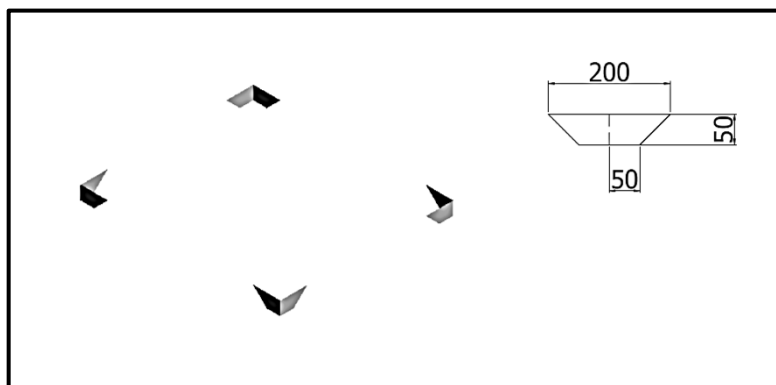
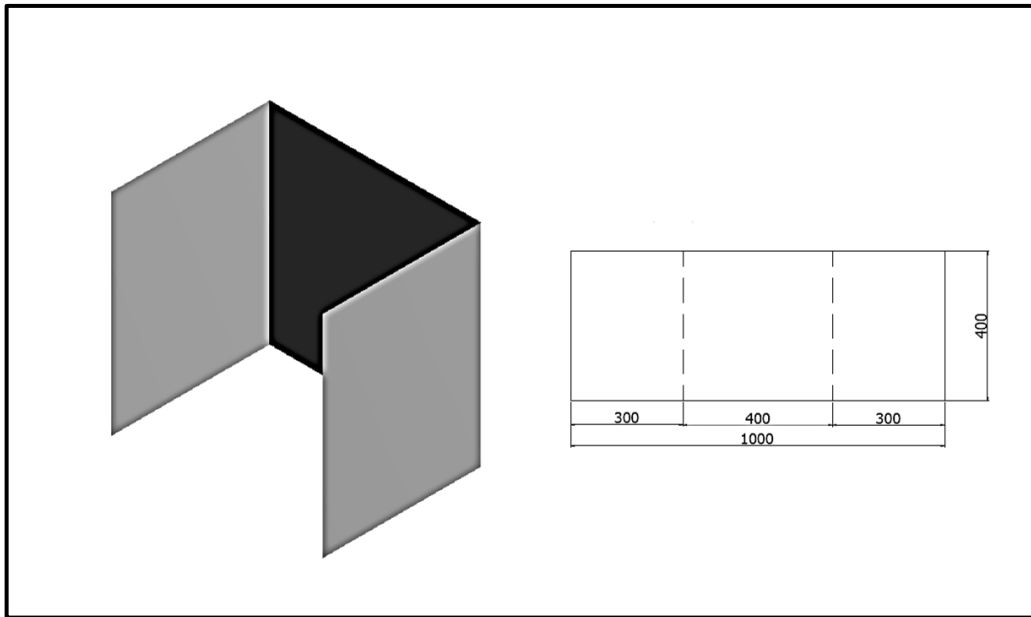
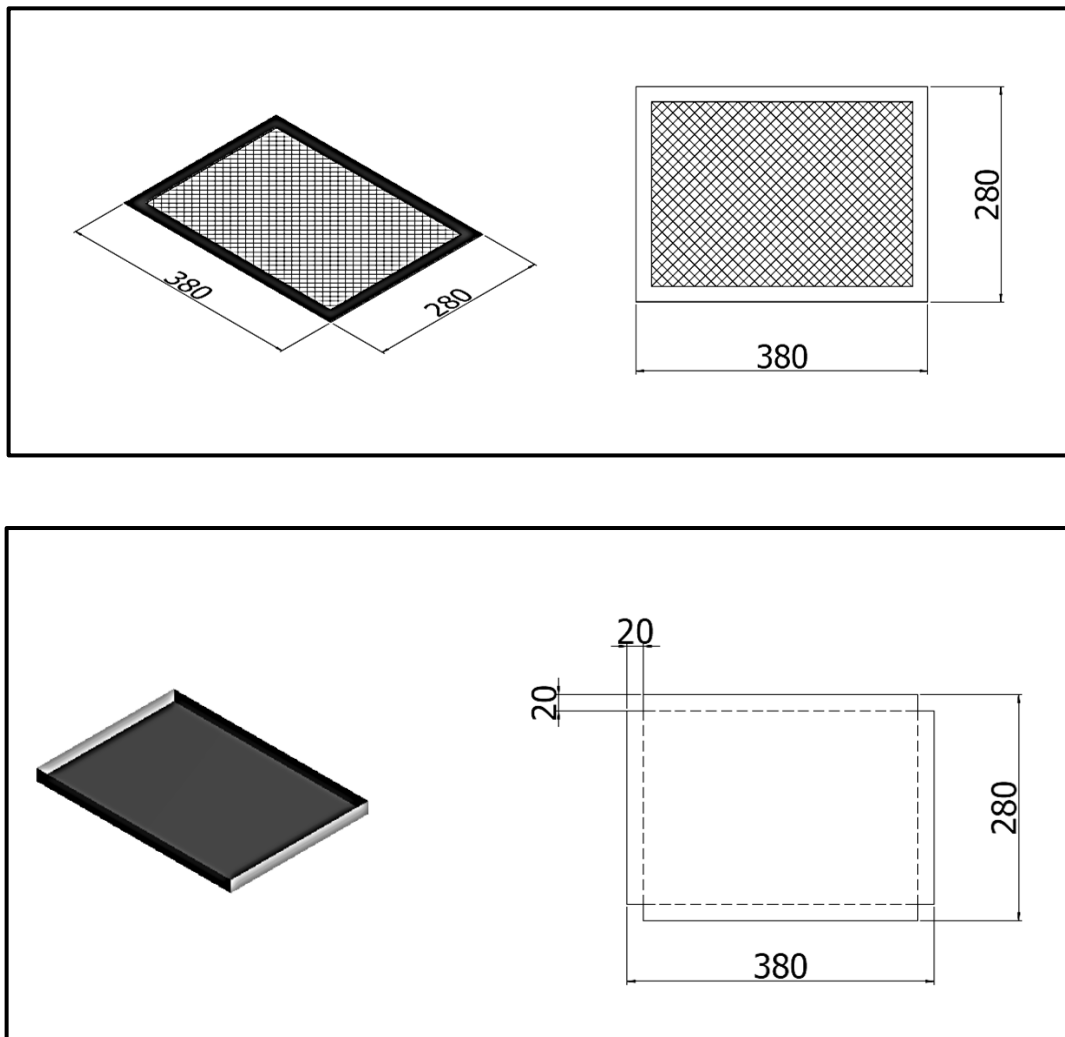


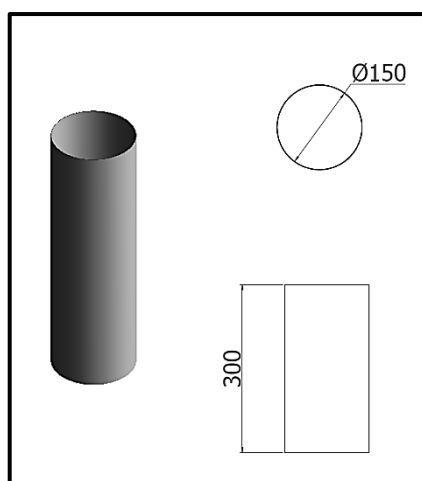
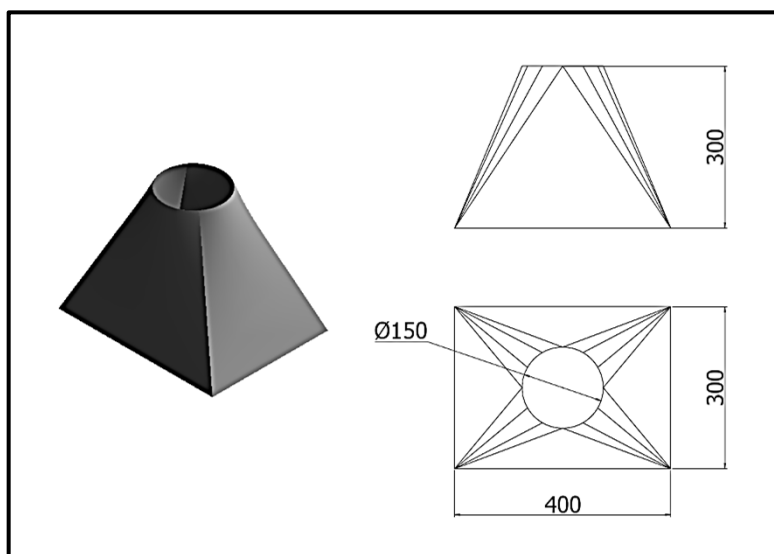
FIGURE 1: SHELL, GRID SUPPORTS AND LEGS

<b>MECHANICAL TECHNOLOGY</b>																
<b>WELDING AND METALWORK</b>																
<b>MARK SHEET – SHELL, GRID SUPPORTS AND LEGS (FIGURE 1)</b>																
<b>GRADE</b>		<b>12</b>		<b>DATE</b>												
<b>PROJECT</b>		<b>BUILT-IN BRAAI</b>														
		<b>LEARNERS</b>														
<b>FACETS</b>	<b>M A R K S</b>															
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
Shell dimensions	10															
Shell bends	5															
Shell welding	10															
Support dimensions	5															
Support placing	5															
Support welding	10															
Leg dimensions	10															
Leg bends	5															
Leg welding	10															
Finish	10															
<b>TOTAL</b>	<b>80</b>															
<b>SIGNATURE OF TEACHER</b>																
<b>SIGNATURE OF SUBJECT HEAD</b>																

**BRAAI GRID AND ASH PAN (FIGURE 2)****FIGURE 2: GRID AND ASH PAN**

<b>MECHANICAL TECHNOLOGY</b>																
<b>WELDING AND METALWORK</b>																
<b>MARK SHEET – BRAAI GRID AND ASH PAN (FIGURE 2)</b>																
<b>GRADE</b>		<b>12</b>		<b>DATE</b>												
<b>PROJECT</b>		<b>BUILT-IN BRAAI</b>														
		<b>LEARNERS</b>														
<b>FACETS</b>	<b>M A R K S</b>															
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
Grid dimensions	5															
Round bar bends	5															
Grid welding	5															
Ash pan dimensions	5															
Ash pan bends	5															
Ash pan welding	5															
Finish	5															
<b>TOTAL</b>	<b>35</b>															
<b>SIGNATURE OF TEACHER</b>																
<b>SIGNATURE OF SUBJECT HEAD</b>																

**TRANSITION PIECE AND CHIMNEY (FIGURE 3)**



**FIGURE 3: TRANSITION PIECE AND CHIMNEY**

<b>MECHANICAL TECHNOLOGY</b>																
<b>WELDING AND METALWORK</b>																
<b>MARK SHEET – TRANSITION PIECE AND CHIMNEY (FIGURE 3)</b>																
<b>GRADE</b>		<b>12</b>		<b>DATE</b>												
<b>PROJECT</b>		<b>BUILT-IN BRAAI</b>														
		<b>LEARNERS</b>														
<b>FACETS</b>	<b>M A R K S</b>															
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
Transition template	15															
Transition marking	10															
Transition cutting	5															
Transition bending	10															
Transition joining	5															
Chimney template	10															
Chimney marking	5															
Chimney cutting	5															
Chimney rolling	5															
Chimney joining	5															
Chimney joining to transition	5															
Finish	5															
<b>TOTAL</b>	<b>85</b>															
<b>SIGNATURE OF TEACHER</b>																
<b>SIGNATURE OF SUBJECT HEAD</b>																

**PAT 2020: CHIMNEY CAP****Criteria for the chimney cap:**

Design a chimney cap to fit onto the chimney top for protection and to prevent objects from falling into the chimney. The chimney cap design must be based on the cone development principles.

The chimney diameter is 150 mm.

Description	Material
Chimney cap	0,8–1 mm sheet metal
3 x supports	2 mm sheet metal

**EXAMPLES:**

NAME: \_\_\_\_\_

1.	<b>Welding – Chimney cap:</b>
1.1	Make use of neat freehand sketches to design THREE possible options for the chimney cap.
<b>OPTION – 1</b>	



**OPTION – 2**

**OPTION – 3**

(6)

(4)	
-----	--

(5)

<b>MECHANICAL TECHNOLOGY</b>																
<b>WELDING AND METALWORK</b>																
<b>MARK SHEET – CHIMNEY CAP (OWN DESIGN)</b>																
<b>GRADE</b>		<b>12</b>			<b>DATE</b>											
<b>PROJECT</b>		<b>BUILT-IN BRAAI</b>														
		<b>LEARNERS</b>														
<b>FACETS</b>	<b>M A R K S</b>															
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
Drawings	5															
Template	10															
Cap	10															
Finish	5															
<b>TOTAL</b>	<b>30</b>															
<b>SIGNATURE OF TEACHER</b>																
<b>SIGNATURE OF SUBJECT HEAD</b>																

<b>MECHANICAL TECHNOLOGY</b>																	
<b>WELDING AND METALWORK</b>																	
<b>MARK SHEET – ASSEMBLY AND TOTALS</b>																	
<b>GRADE</b>		<b>12</b>		<b>DATE</b>													
<b>PROJECT</b>		<b>BUILT-IN BRAAI</b>															
		<b>LEARNERS</b>															
<b>FACETS</b>	<b>M A R K S</b>																
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	
Safety	5																
Assemble transition/chimney to shell	10																
Presentation	10																
<b>TOTAL</b>	<b>25</b>																
<b>TOTALS</b>																	
Shell, legs and grid supports	80																
Braai-grid and ash pan	30																
Transition piece and chimney	85																
Chimney cap	30																
Assembly	25																
<b>TOTAL</b>	<b>250</b>																
<b>Total PAT Mark</b>	<b>100</b>																
<b>SIGNATURE OF TEACHER</b>																	
<b>SIGNATURE OF SUBJECT HEAD</b>																	

## **5. CONCLUSION**

On completion of the practical assessment task learners should be able to demonstrate their understanding of the industry, enhance their knowledge, skills, values and reasoning abilities as well as establish connections to life outside the classroom and address real-world challenges. The PAT furthermore develops learners' life skills and provides opportunities for learners to engage in their own learning.