



HENLEY
HIGH SCHOOL

Building Teacher & Leader Capacity in **STEM@HenleyHS**





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Create a school culture where the importance of STEM is recognised and valued and there are high expectations for all students to engage with STEM education opportunities

Recognise that STEM education approaches work best when supported by a whole-of-school collaborative effort (Principle 1 & 4, National STEM School Education Strategy, Education Council, Dec 2015)





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STEM@Henley

- ❖ Improvement in student engagement, achievement and retention in STEM to Year 12 and beyond
- ❖ STEM leaders and teachers trialling alternative pedagogies and developing STEM integrated units of work/activities
- ❖ STEM leaders and teachers accessing opportunities for T&D in STEM leadership and Quality Teaching
- ❖ Promotion of STEM to the whole school community and beyond
- ❖ STEM partnerships with Universities, Industry and Business
- ❖ STEM international partnerships and opportunities
- ❖ Increase in student leadership through the STEM
- ❖ Identification and mentoring of Year 8 STEMLings to Year 12
- ❖ Information and support for students and parents in choice of pathways through and post school in STEM



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DECD STEM Learning Strategy

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- ❖ **Build expertise in STEM teaching and learning across all years**
- ❖ **Engage students at all year levels in STEM education**
- ❖ **Develop systemic excellence in STEM education**



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Develop systemic excellence in **STEM education**

- ❖ **Vision**
- ❖ **Culture**
- ❖ **Advocacy**
- ❖ **Structure**

DECD Leadership Framework capabilities		Site leader category
Leadership qualities and behaviours		
Shapes systems thinking and change leadership	<ul style="list-style-type: none"> Creates vision Inspires people Thinks and acts strategically Leads and influences change Solves problems 	Leads improvement, innovation and change <ul style="list-style-type: none"> Identifies the need for innovation and improvement consistent with their site or school's vision and values Communicates the need for change in an inspiring and logical way Deepens their own knowledge and understanding of improvement strategies, leading change and innovation at a whole-of-site level Engages and inspires staff to commit to evidence-based improvement, change and innovation
Achieves results	<ul style="list-style-type: none"> Achieves agreed goals and delivers results Drives organisational effectiveness Makes well-informed, effective and timely decisions Manages compliance with legislation Holds self and others accountable for their actions Monitors and evaluates their business performance Applies relevant and current technical expertise 	Leads the management of the site <ul style="list-style-type: none"> Aligns management procedures and processes to the goals, vision and values of their site Ensures employment practices and decisions are consistent with legislative requirements Allocates resources effectively to maintain day-to-day operations at the site, based on impact and value for money Clarifies for staff the relationship between the site's vision and values and the operational tasks that support them
Leads organisational excellence	<ul style="list-style-type: none"> Influences organisational performance Anticipates and plans for future organisational needs Leads and develops their people Builds capability and expertise Promotes a customer service ethos Manages internal and external resources 	Leads teaching and professional practice <ul style="list-style-type: none"> Ensures the organisation's values underpin and support high quality inclusive practices and set expectations that all activities are focused on improving outcomes Keeps up to date with current developments in pedagogy and professional services Leads staff in identifying and planning high quality service delivery
Forges relationships and engages others	<ul style="list-style-type: none"> Develops and uses political astuteness Negotiates and influences Manages conflict Promotes information sharing and gathering of knowledge Establishes and maintains strategic networks Communicates effectively and adapts to audience 	Engages and works with the community <ul style="list-style-type: none"> Promotes parental and carer engagement as a key aspect of raising the achievement of all students and clients Leads inclusively and promotes a culture of understanding and respect for Aboriginal histories, culture and language and other culturally and linguistically diverse communities Builds partnerships with the local community and works with other agencies to support the health, wellbeing and safety of students, clients and their families
Exemplifies personal drive and professionalism	<ul style="list-style-type: none"> Models South Australian public sector values Uses judgement in considering risk Displays flexibility and resilience Demonstrates self-awareness and commitment to personal development Promotes and integrates diversity into the workplace Values wellbeing for self and others Is transparent and accountable for their performance and actions 	Develops self and others <ul style="list-style-type: none"> Promotes the benefits of professional learning to all staff and ensures their willingness and efforts to learn and improve are recognised Develops and implements a personal and organisational vision that links all learning and development activities to achieving better outcomes Works with staff to identify and prioritise learning needs Models personal and professional learning that is clearly linked to the organisation's goals
Maintains and enhances confidence in SA public education and care	<ul style="list-style-type: none"> Ensures all decisions are objective and fair Operates ethically and with integrity Is a role model for customer-centred service Embraces an adaptive leadership approach 	Maintains and enhances confidence in SA public education and care <ul style="list-style-type: none"> Ensures all decisions are objective and fair Operates ethically and with integrity Is a role model for student and client-centred service Embraces an adaptive leadership approach
Facilitates workforce effectiveness	<ul style="list-style-type: none"> Seeks continuous improvement Ensures ongoing professional development of their people Uses performance feedback and development plans to nurture the capability of their people Promotes a high performing team environment Establishes clearly defined roles and responsibilities Ensures a safe working environment for all their people Promotes a collaborative working environment 	Facilitates workforce effectiveness <ul style="list-style-type: none"> Seeks continuous improvement Ensures ongoing professional development of their people Uses performance feedback and development plans to nurture the capability of their people Promotes a high performing team environment Ensures a safe working environment for all their people Promotes a collaborative working environment Is mindful and cares for their people

- ❖ STEM in site strategic plan
- ❖ Leadership structure
- ❖ Assistant Principal STEM & Quality Teaching
- ❖ Goals, Targets & KPI's
- ❖ Line management process
- ❖ Professional Development Plans
- ❖ Timetable structure
- ❖ Resources – Grants
- ❖ Networks – DECD, University, Industry, Community

2017 Sandra Moran KPI's STEM + QT

Achievements in 2016	Targets	KPI's
STEM documented in Henley HS Site Strategic Plan and promoted STEM people of the year	<ul style="list-style-type: none"> STEM leadership and promotion to the whole school community and beyond improved 	<ul style="list-style-type: none"> STEM documented in strategic plan 2016-17. KPI's reported against to Management and Governing Council STEM promoted through Website, ATP, WASSN Increase focus on statewide, nationally, especially internationally Website up-dated regularly More promotion
STEM Coordinators collaborated to develop, trial, implement and promote resources: <ul style="list-style-type: none"> ACARA/AAMT STEM Connections project Presentations ACARA - Sydney, MASA – Adelaide, ATP Managers – EDC T&D accessed by STEM staff – e.g. C2C training, Science by Doing, Tonsley Park, ACARA/AAMT 	<ul style="list-style-type: none"> STEM leaders and teachers trial alternative pedagogies and develop STEM integrated units of work/activities Digital Tech across the Curriculum STEM leaders and teachers access opportunities for T&D in STEM leadership and Quality Teaching Plan developed for STEM Works (facilities, resources & SSO hours) 	<ul style="list-style-type: none"> Trials documented and reviewed. Exemplars of best practice videoed shared/stored on website/at conferences Increase in Cross Curriculum Integrated units 1 at each Year 8/9/10 1 or 2? staff involved in ATP STEM leadership program if program runs – spotlight on program, share PD with staff whole school, curriculum, individual Audit of structured STEM PD program in place 2017 & ongoing Audit of STEM facilities & resources, plan developed for STEM Works 2017 & ongoing
STEM data interrogated and new initiatives implemented for 2017 ie. Year 9 STEM Connections ACARA/AMASTA <ul style="list-style-type: none"> ↑ in no.s choosing SACE STEM subjects, Maths & Science in particular ATP data 2009-16 indicates ↑ in no.s in STEM & ↑ in student achievement in STEM ACARA/AAMT STEM project feedback +ve re student engagement, authentic assessment 	<ul style="list-style-type: none"> Collection and interrogation of STEM data indicates improvement in student engagement, achievement and retention in STEM. 	<ul style="list-style-type: none"> DATA to the ATP DECD office for <ul style="list-style-type: none"> Semester 2, 2017 by week 5 Term 1, 2017 Semester 1, 2017 by week 2 Term 3, 2017 ATP Year 8-9 & Year 10 – 11 student surveys ATP Teacher surveys & interviews Data informs Course Counselling & Subject selection process and Science, Tech & Maths KPI's Collection of destination Data on students in post school STEM pathways
ATP, WASSN STEM, Career Strategy projects successfully developed, initiated, implemented and acquitted. <ul style="list-style-type: none"> ATP funding acquitted against criteria UniSA WASSN STEM programs ↑ Feedback from UniSA surveys indicated that all students were engaged in programs 	<ul style="list-style-type: none"> ATP and WASSN STEM projects successfully led, outcomes achieved and funding acquitted 	<ul style="list-style-type: none"> Regional mtgs 1 x term, Thurs, Week 3, Work with regional partner schools to organise, cost and run WASSN STEM/ATP activities Attend the ATP Managers half-day meetings once a term

Build expertise in STEM teaching and learning across all years

Key areas for building leadership capabilities and behaviours

- ❖ **performance and development**
- ❖ **professional development**
- ❖ **career planning conversations**
- ❖ **recruitment**
- ❖ **succession planning**

DECD Leadership Framework capabilities	Professional leader category	Leadership qualities and behaviours
Shapes systems thinking and change leadership	<ul style="list-style-type: none"> Creates vision Inspires people Thinks and acts strategically Leads and influences change Solves problems 	<ul style="list-style-type: none"> Respected for their knowledge and expertise Supports and shares their knowledge and expertise with colleagues Keeps colleagues informed of trends and changes Links to other disciplines and resources, both internally and externally
Achieves results	<ul style="list-style-type: none"> Achieves agreed goals and delivers results Drives organisational effectiveness Makes well-informed, effective and timely decisions Manages compliance with legislation Holds self and others accountable for their actions Monitors and evaluates their business performance Applies relevant and current technical expertise 	<ul style="list-style-type: none"> Leads professional area to achieve agreed results Analyses student or client needs and delivers learning and professional services that ensure high performance outcomes Monitors trends and delivers learning and professional services that satisfy changing student, client and community requirements Secures the commitment of leaders and colleagues to ensure the delivery of high quality learning, support and professional services Analyses discipline resource requirements Develops resource plans to support achievement of discipline objectives Allocates resources to achieve discipline objectives Reviews and reports on resource usage Interprets and communicates requirements of policy and implements policy relating to discipline Ensures compliance with all relevant legislation in implementing policy.
Leads organisational excellence	<ul style="list-style-type: none"> Influences organisational performance Anticipates and plans for future organisational needs Leads and develops their people Builds capability and expertise Promotes a customer service ethos Manages internal and external resources 	<ul style="list-style-type: none"> Leads professional practice and excellence Provides discipline leadership to individuals and work teams Creates a cooperative work environment Monitors and responds to workplace issues and discipline concerns Motivates individuals and work teams to achieve quality results Delegates work to achieve discipline and work unit objectives Manages up
Forges relationships and engages others	<ul style="list-style-type: none"> Develops and uses political astuteness Negotiates and influences Manages conflict Promotes information sharing and gathering of knowledge Establishes and maintains strategic networks Communicates effectively and adapts to audience 	<ul style="list-style-type: none"> Establishes and maintains strategic networks Identifies features and key people and resources of strong discipline strategic networks Identifies and establishes network links with key stakeholders and other discipline leaders Builds strategic relationships Applies knowledge of organisational linkages Applies knowledge of inter-governmental linkages Applies knowledge of political context
Exemplifies personal drive and professionalism	<ul style="list-style-type: none"> Models South Australian public sector values Uses judgement in considering risk Displays flexibility and resilience Demonstrates self-awareness and commitment to personal development Promotes and integrates diversity into the workplace Values well-being for self and others Is transparent and accountable for their performance and actions 	<ul style="list-style-type: none"> Develops self and other discipline members Establishes personal work goals Sets and meets own work priorities Develops and maintains professional capabilities and competencies
Maintains and enhances confidence in SA public education and care	<ul style="list-style-type: none"> Ensures all decisions are objective and fair Operates ethically and with integrity Is a role model for customer-centred service Embraces an adaptive leadership approach 	<ul style="list-style-type: none"> Maintains and enhances confidence in SA public education and care Ensures all decisions are objective and fair Operates ethically and with integrity Is a role model for student and client-centred service Embraces an adaptive leadership approach
Facilitates workforce effectiveness	<ul style="list-style-type: none"> Seeks continuous improvement Ensures ongoing professional development of their people Uses performance feedback and development plans to nurture the capability of their people Promotes a high performing team environment Establishes clearly defined roles and responsibilities Ensures a safe working environment for all their people Promotes a collaborative working environment 	<ul style="list-style-type: none"> Facilitates professional team effectiveness Seeks continuous improvement in their professional discipline Arranges ongoing professional development of their people in the discipline area Where appropriate, uses performance feedback and development plans to nurture the development of their people Promotes a high performing team environment Ensures a safe working environment for all their people Promotes a collaborative working environment

Coordinator Leadership Opportunities

- ❖ Short term vacancies in Leadership team
- ❖ Project Coordinators – ATP, STEM Empowering Local Schools National Partnership, Digital Literacies Schools Grant 2017
- ❖ ACARA/AAMT Year 9 STEM Challenge
- ❖ Henley Trade Training Centre & VET & Expo
- ❖ STEM PD for visiting schools
- ❖ Access to Leading Learning PD
- ❖ Site Aspiring Leaders program
- ❖ Presentations of Professional Learning
 - ACARA STEM Sydney 2014, 2015
 - AAMT conference 2015
 - MASA conference 2015
 - Limestone Coast 2016 & Murraylands STEM summit
 - FlipCon 2016

DECD Leadership Framework capabilities	Leadership qualities and behaviours
Shapes systems thinking and change leadership <ul style="list-style-type: none"> Creates vision Inspires people Thinks and acts strategically Leads and influences change Solves problems 	Implements change <ul style="list-style-type: none"> Prepares for change Implements and monitors change Works with ambiguity in the workplace Has an appreciation of systems thinking
Achieves results <ul style="list-style-type: none"> Achieves agreed goals and delivers results Drives organisational effectiveness Makes well-informed, effective and timely decisions Manages compliance with legislation Holds self and others accountable for their actions Monitors and evaluates their business performance Applies relevant and current technical expertise 	Addresses client needs <ul style="list-style-type: none"> Assists clients to articulate needs Satisfies client needs Exercises judgement to resolve client service issues Responds to enquiries Receives and gives directions Participates in meetings Makes presentations within the workgroup
Leads organisational excellence <ul style="list-style-type: none"> Influences organisational performance Anticipates and plans for future organisational needs Leads and develops their people Builds capability and expertise Promotes a customer service ethos Manages internal and external resources 	Works effectively in the organisation <ul style="list-style-type: none"> Applies information relating to the machinery of government Applies knowledge of organisational functions Applies knowledge of protocols
Forges relationships and engages others <ul style="list-style-type: none"> Develops and uses political astuteness Negotiates and influences Manages conflict Promotes information sharing and gathering of knowledge Establishes and maintains strategic networks Communicates effectively and adapts to audience 	Builds and maintains internal and external networks <ul style="list-style-type: none"> Identifies key internal stakeholders Builds internal links with key internal stakeholders Participates in professional and community networks and forums to broaden and improve practice
Exemplifies personal drive and professionalism <ul style="list-style-type: none"> Models South Australian public sector values Uses judgement in considering risk Displays flexibility and resilience Demonstrates self awareness and commitment to personal development Promotes and integrates diversity into the workplace Values wellbeing for self and others Is transparent and accountable for their performance and actions 	Gives and receives workplace feedback <ul style="list-style-type: none"> Seeks and acts on workplace feedback Provides informal feedback in the workplace Provides formal feedback in the workplace Participates in learning to update knowledge and practice, targeted to professional needs and/or system priorities
Maintains and enhances confidence in SA public education and care <ul style="list-style-type: none"> Ensures all decisions are objective and fair Operates ethically and with integrity Is a role model for customer-centred service Embraces an adaptive leadership approach 	Maintains and enhances confidence in SA public education and care <ul style="list-style-type: none"> Applies ethical standards Deals with ethical problems Understands the implications of and complies with relevant legislative, administrative, organisational and professional requirements, policies and processes
Facilitates workforce effectiveness <ul style="list-style-type: none"> Seeks continuous improvement Ensures ongoing professional development of their people Uses performance feedback and development plans to nurture the capability of their people Promotes a high performing team environment Establishes clearly defined roles and responsibilities Ensures a safe working environment for all their people Promotes a collaborative working environment 	Contributes to workgroup activities <ul style="list-style-type: none"> Establishes workgroup parameters Participates in the workgroup Assists workgroup members Recognises and values individual differences Works effectively with diverse clients and colleagues Keeps up to date and seeks continuous improvement in the professional discipline

- ❖ Manager Sub School (SWB), Curriculum, project
- ❖ Highly accomplished & Lead teacher
- ❖ Leads year level curriculum team
- ❖ STEM Early Career Teacher Awards
- ❖ Mentor teacher for peers & University Interns/Pre Service Teachers
- ❖ ATP Teacher in Residence
- ❖ Access to Quality Teaching PD
- ❖ Leads activities:
 - C2C
 - F1 in Schools
 - Coding Club
 - Science & Engineering Challenge
 - Sub School 7/8 STEM CIP
 - Young Women in Technology
 - Thinking Maths 2017/18
 - Integrated Curriculum
 - Girls in STEM PLC
 - WASSN PLC
 - ANSTO Big Ideas Challenge
 - Year 8 Enriching Maths



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Engage students at all year levels in STEM education

- ❖ engagement
- ❖ achievement
- ❖ retention



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Expose students (and their teachers) to a wide range of career options and information early to increase STEM aspirations and engagement, ideally in primary school and continuing throughout high school, and involving parents and school communities where possible (Principle 1 & 4, National STEM School Education Strategy, Education Council, Dec 2015)

- ❖ Concept2Creation, STEM Sista & STEM Mista
- ❖ Year 9 STEM Challenge
- ❖ Year 8 STEMLings
- ❖ Year 9/10 & Year 11 WASSN High Achievers STEM program
- ❖ F1 in Schools
- ❖ Young Women In Technology
- ❖ Science & Engineering Challenge
- ❖ University of Adelaide Engineering Expo – Ingenuity
- ❖ Henley VET & TTC Expo, Tuesday 31st May 5-7pm
- ❖ 10 Henley HS students have accessed the University of Adelaide Early entry program 2016 & 2017, with the guarantee of a position in a Science degree



Consider how to evaluate new partnerships and learning approaches as part of program design, to determine whether change has occurred in student attitudes to STEM, and whether this translates into greater STEM achievement (Principle 7, National STEM School Education Strategy, Education Council, Dec 2015)

Quality Teaching and Learning

Links with University/Industry/Community exposes students to authentic, real world opportunities and experiences

University Partnerships

- ❖ University of Adelaide, UniSA, Flinders University
- ❖ 2016 10 Henley HS students have accessed the University of Adelaide Early entry program, with the guarantee of a position in a Science degree course in 2017
- ❖ Bob Hill STEM award

Industry Partnerships

- ❖ Muradel, Hendon Semi Conductors, Dematec, Grundfos, Mars Society of Australia, Comace

International Partnerships

- ❖ Koishikawa STEM Skype
- ❖ Jay Prizker Academy STEM Exchange: Adelaide 4th June-9th July, Cambodia 11th-24th September



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What have we achieved in STEM in SACE?



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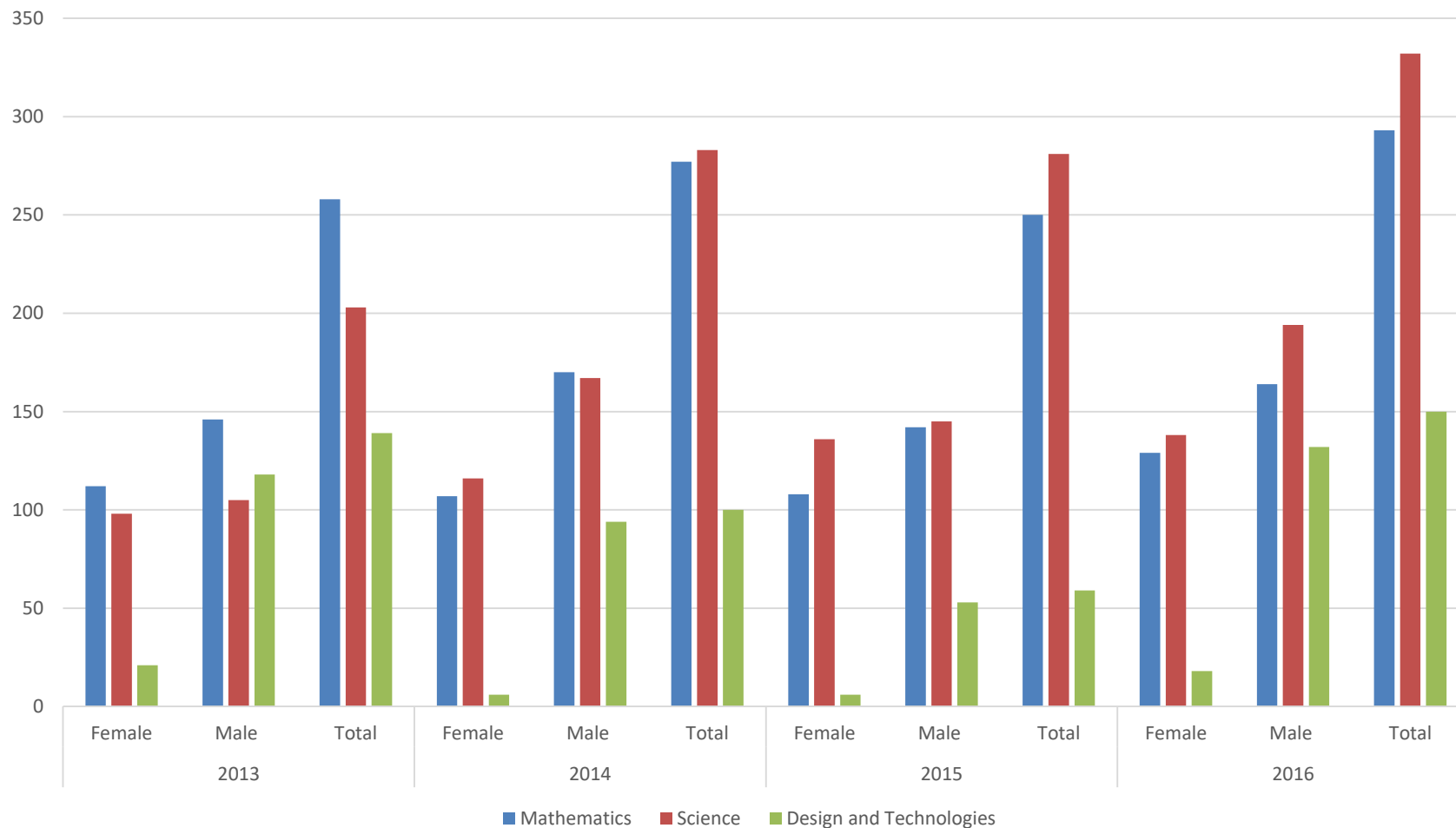
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Stage 1 STEM Subjects Enrolments 2013 -16

Stage 1 STEM subjects - enrolments 2013 to 2016 Henley High School



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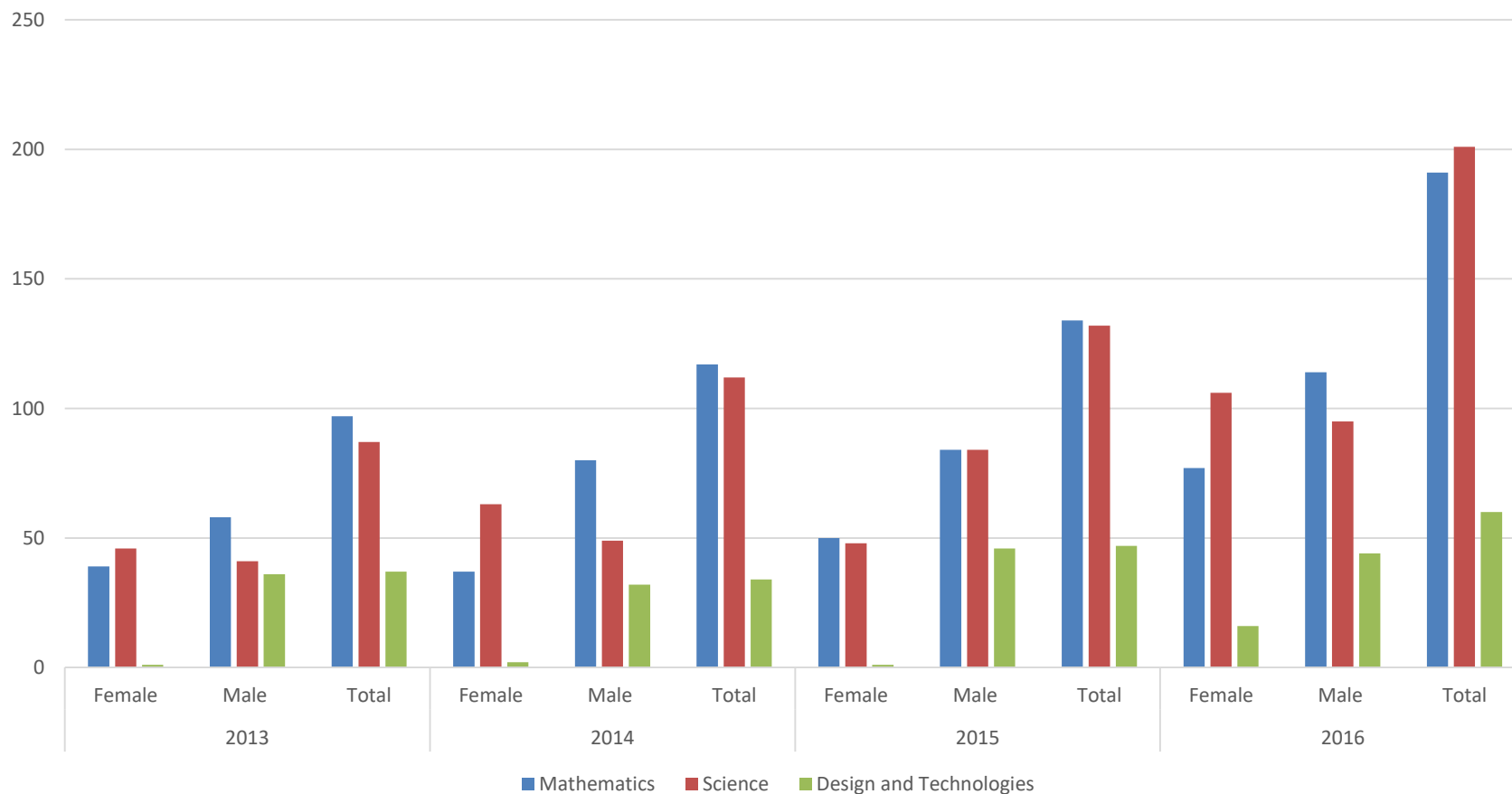
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Stage 2 STEM Subjects Enrolments 2013 -16

Stage 2 STEM - enrolments 2013 - 2016
Henley High School



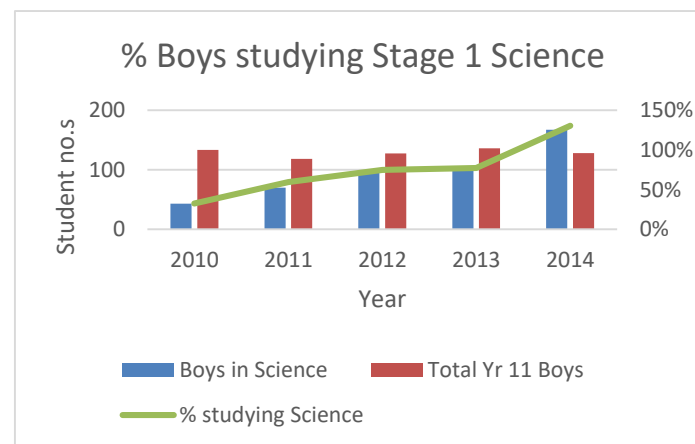
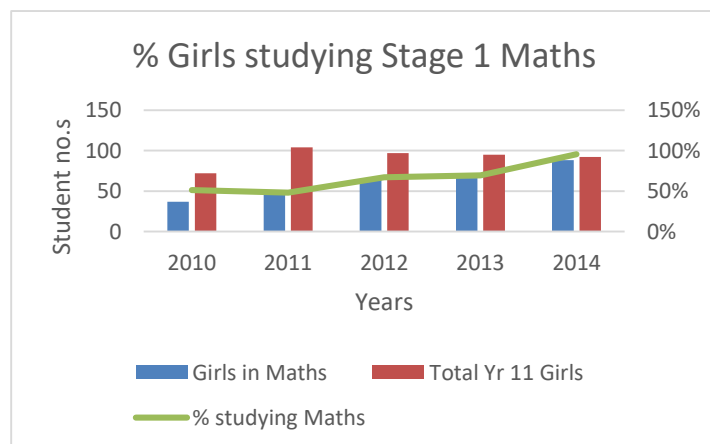
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Use school demographic data and the local context to guide choices about partnership and outreach programs, and consider how best to target student cohorts less likely to do STEM subjects or see the relevance of STEM-related skills (Principle 6, National STEM School Education Strategy, Education Council, Dec 2015)

- ❖ Year 10 Girls in Technology/Stage 2 Jewellery Manufacture
- ❖ Year 10 Girls 2009 – 7 in Design & Technology 2016 - 31
- ❖ No girls in Stage 1&2 Design & Technology in 2009, 2016 - 20
- ❖ Year 10/Stage 1 Advanced Engineering
- ❖ Year 12/Stage 2 Advanced Engineering
- ❖ 2015 10 Year 9 students studying Year 10 Maths, 2016 - 7 in Stage 1

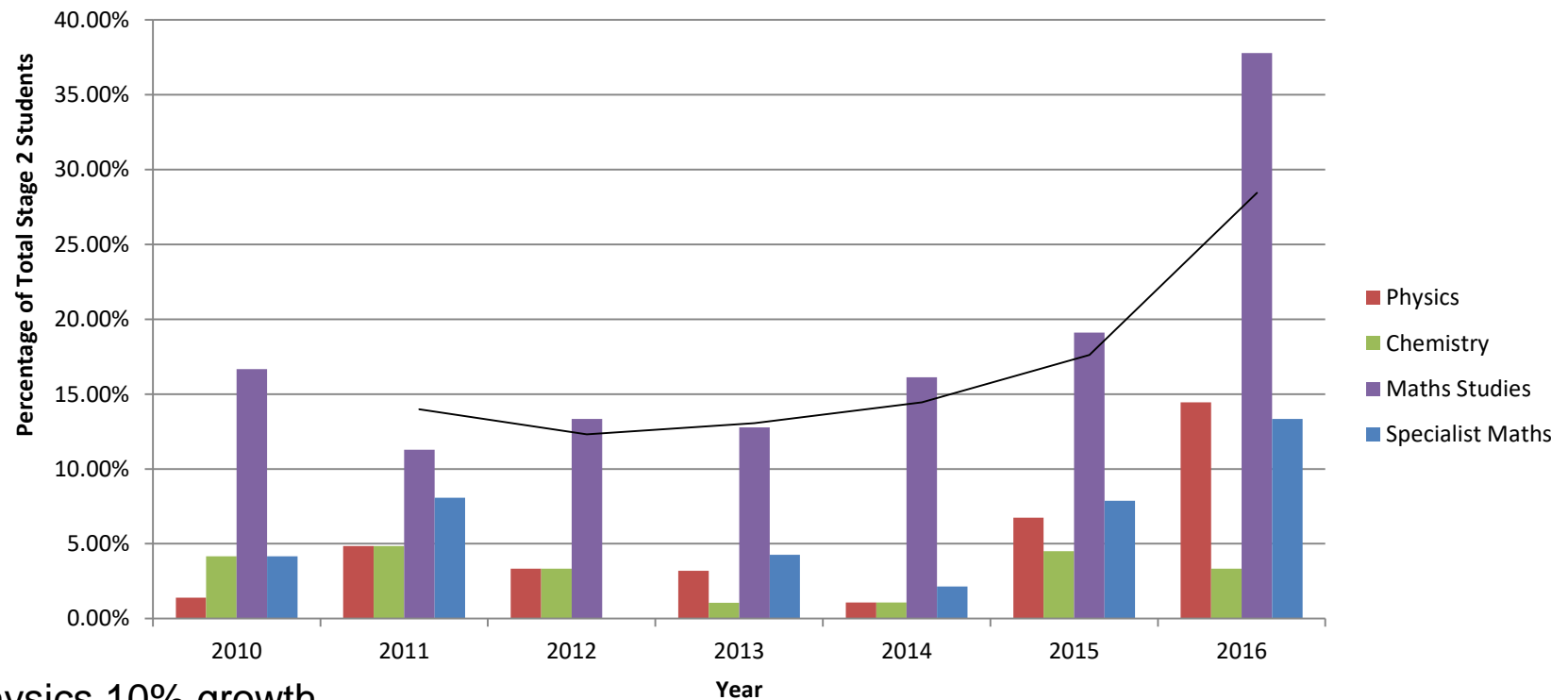




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Consider how to evaluate new partnerships and learning approaches as part of program design, to determine whether change has occurred in student attitudes to STEM, and whether this translates into greater STEM achievement (Principle 7, National STEM School Education Strategy, Education Council, Dec 2015)

Enrolment of Girls in Non-Traditional Stage 2 Maths/Science Subjects



Physics 10% growth
Maths Studies 21% Growth
Maths Specialist 9% Growth

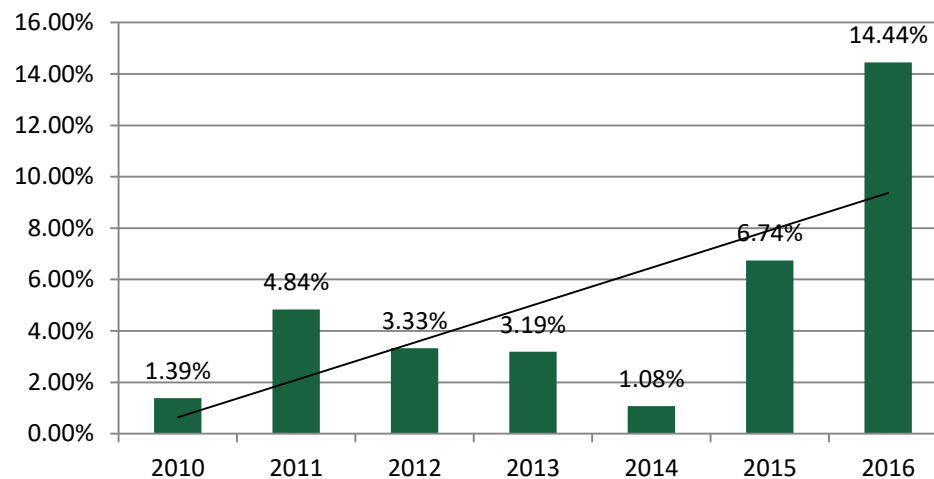


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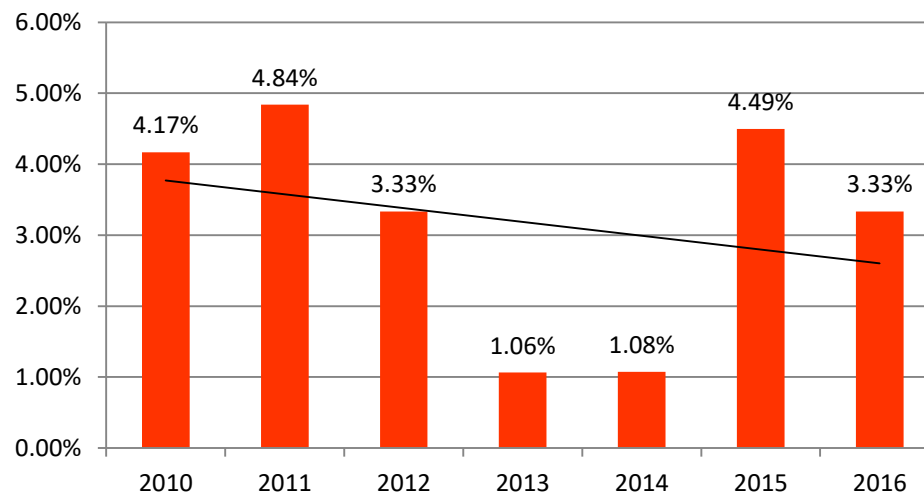


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Girls in Physics



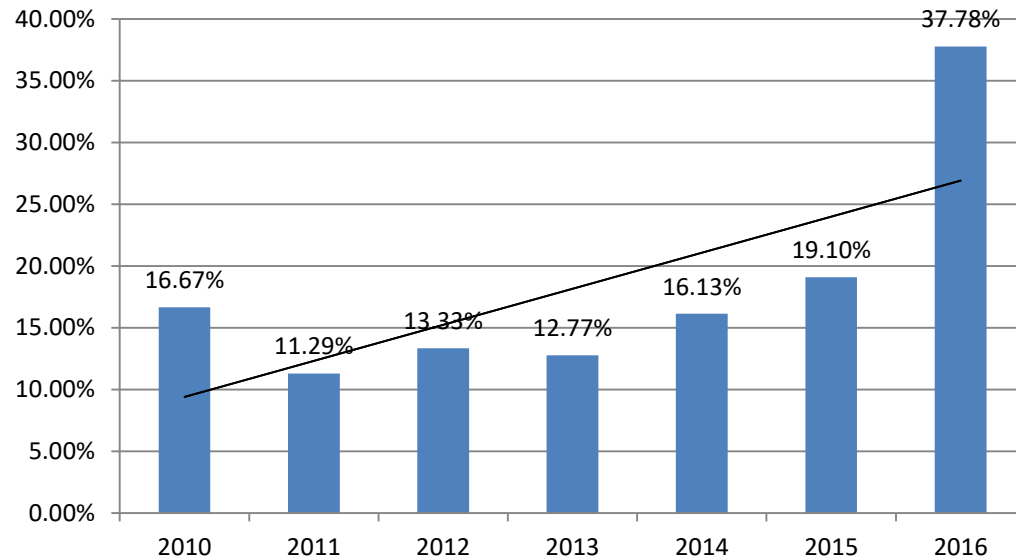
Girls in Chemistry



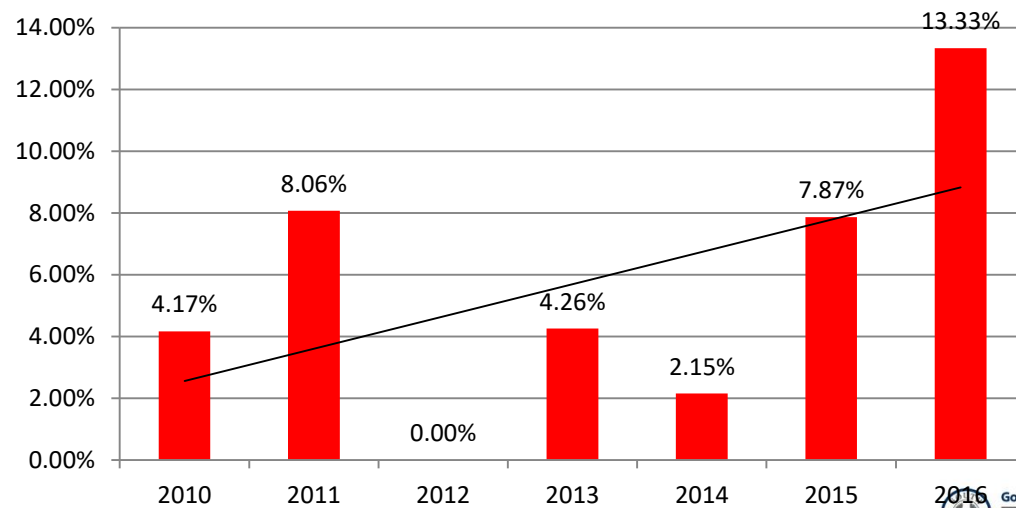


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Girls in Maths Studies



Girls in Specialist Maths



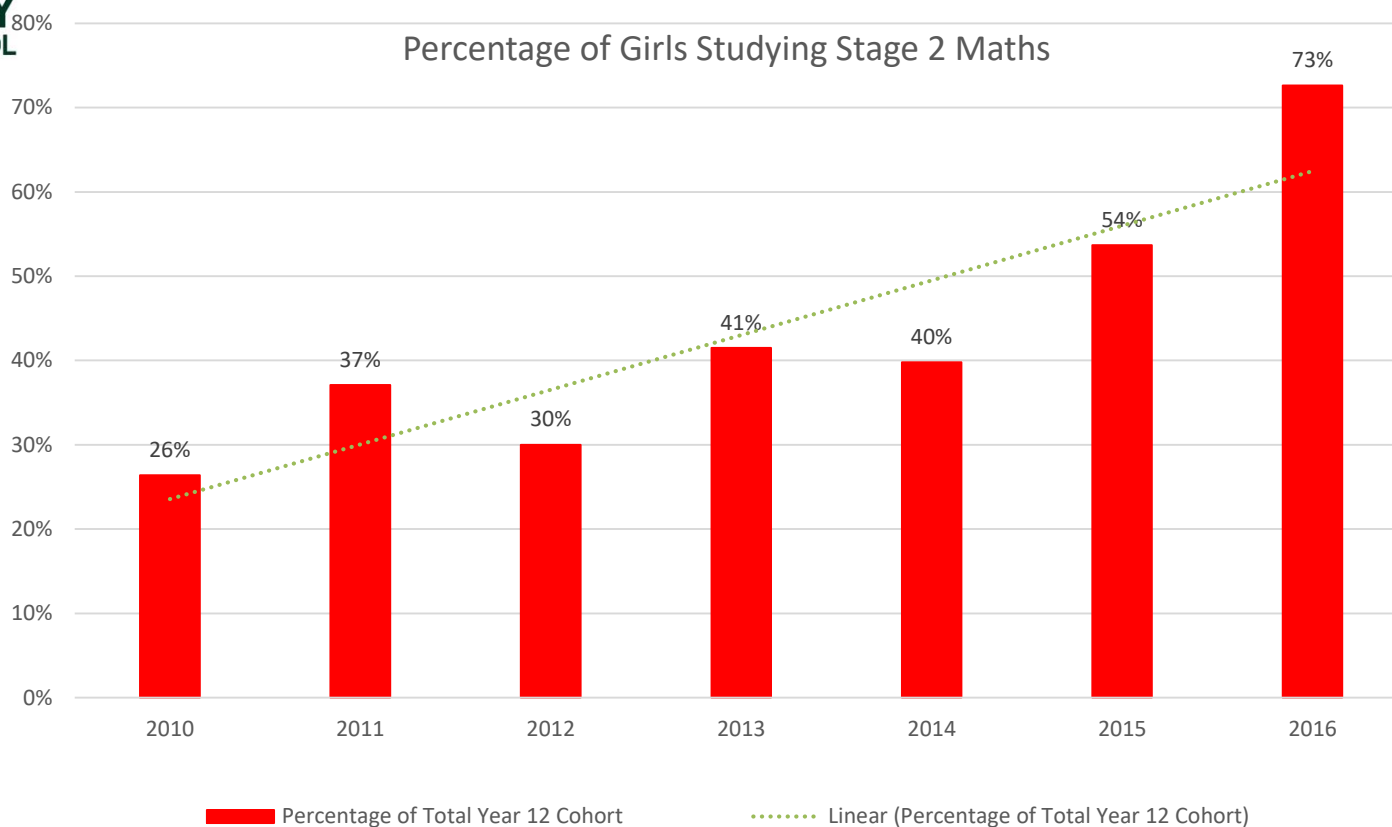
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Growth in Stage 2 Maths Enrolments



Since 2010 the percentage of girls studying year 12 maths has approximately tripled.



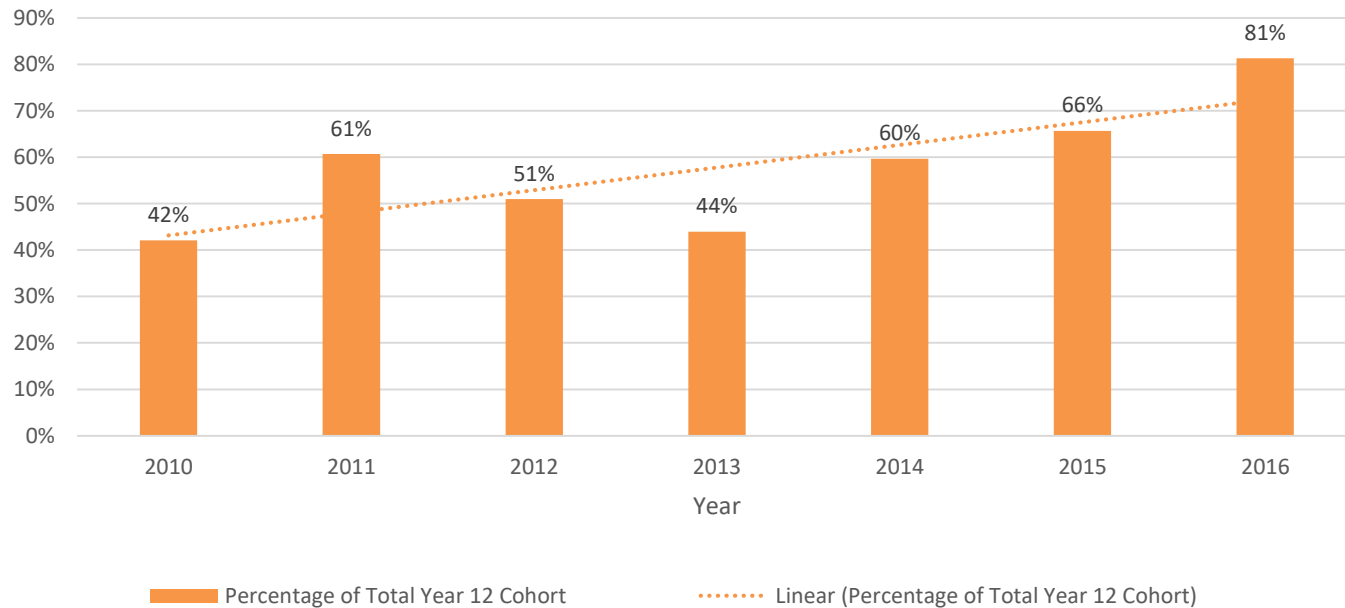
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Growth in Stage 2 Maths Enrolments

Percentage of Boys Studying Stage 2 Maths



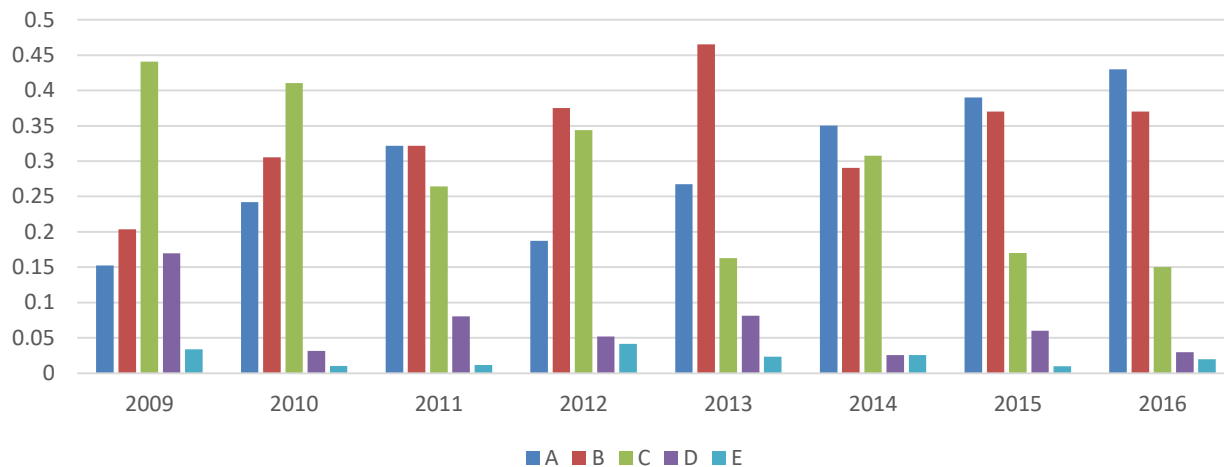
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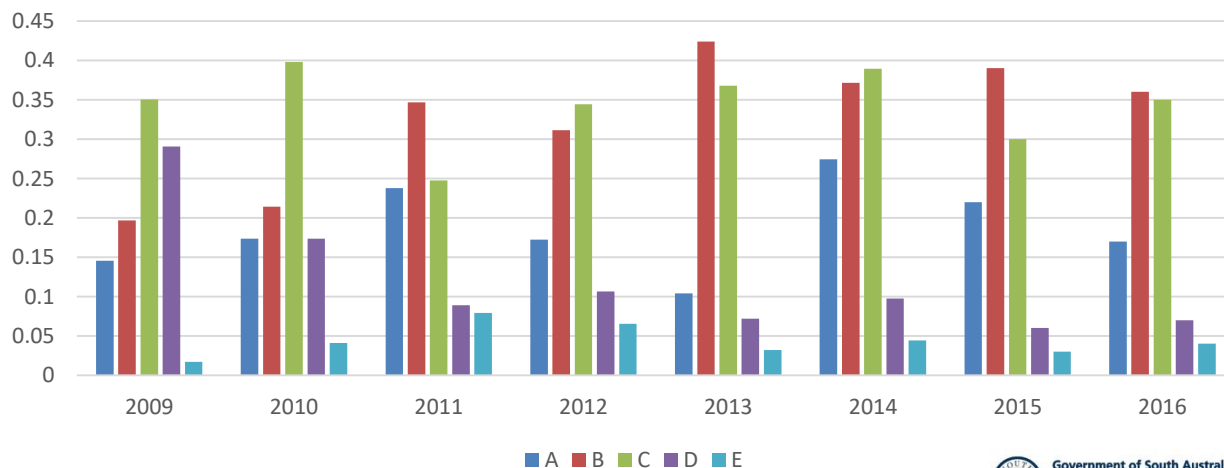
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Year 10 Maths Achievement 2009-16

Year 10 Girls- Mathematics A-E



Year 10 Boys Mathematics A-E



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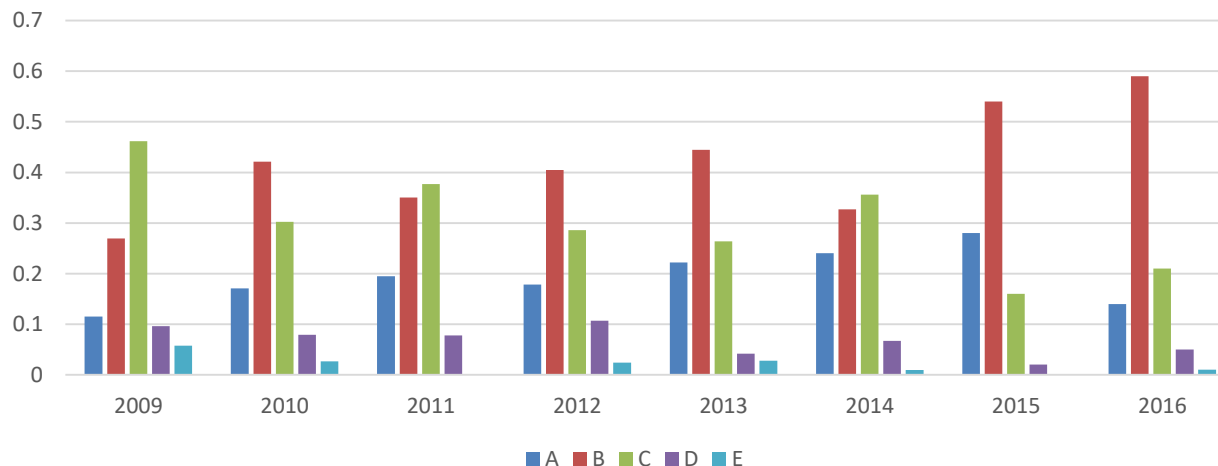
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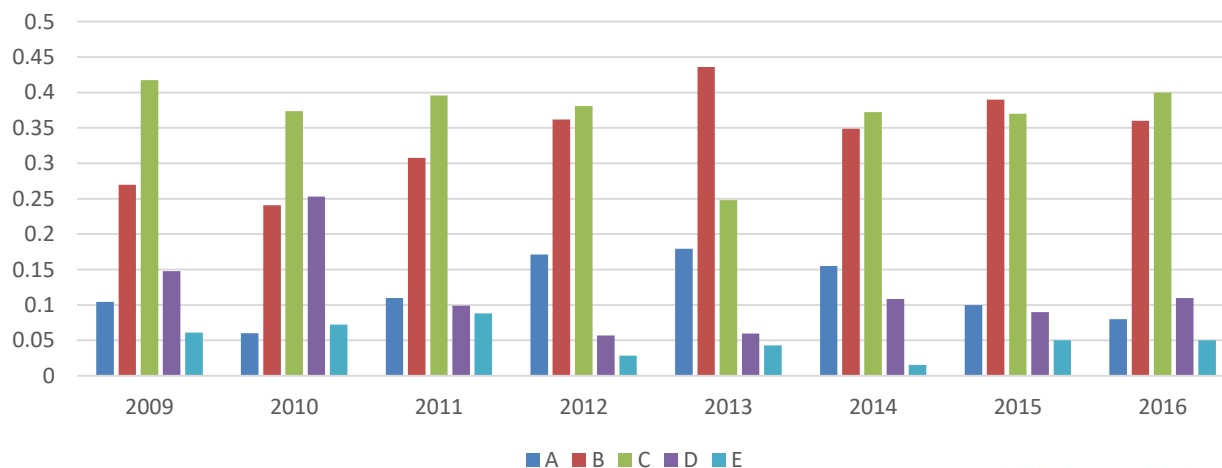
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Year 10 Science Achievement 2009-16

Year 10 Girls Science A-E



Year 10 Boys Science A-E



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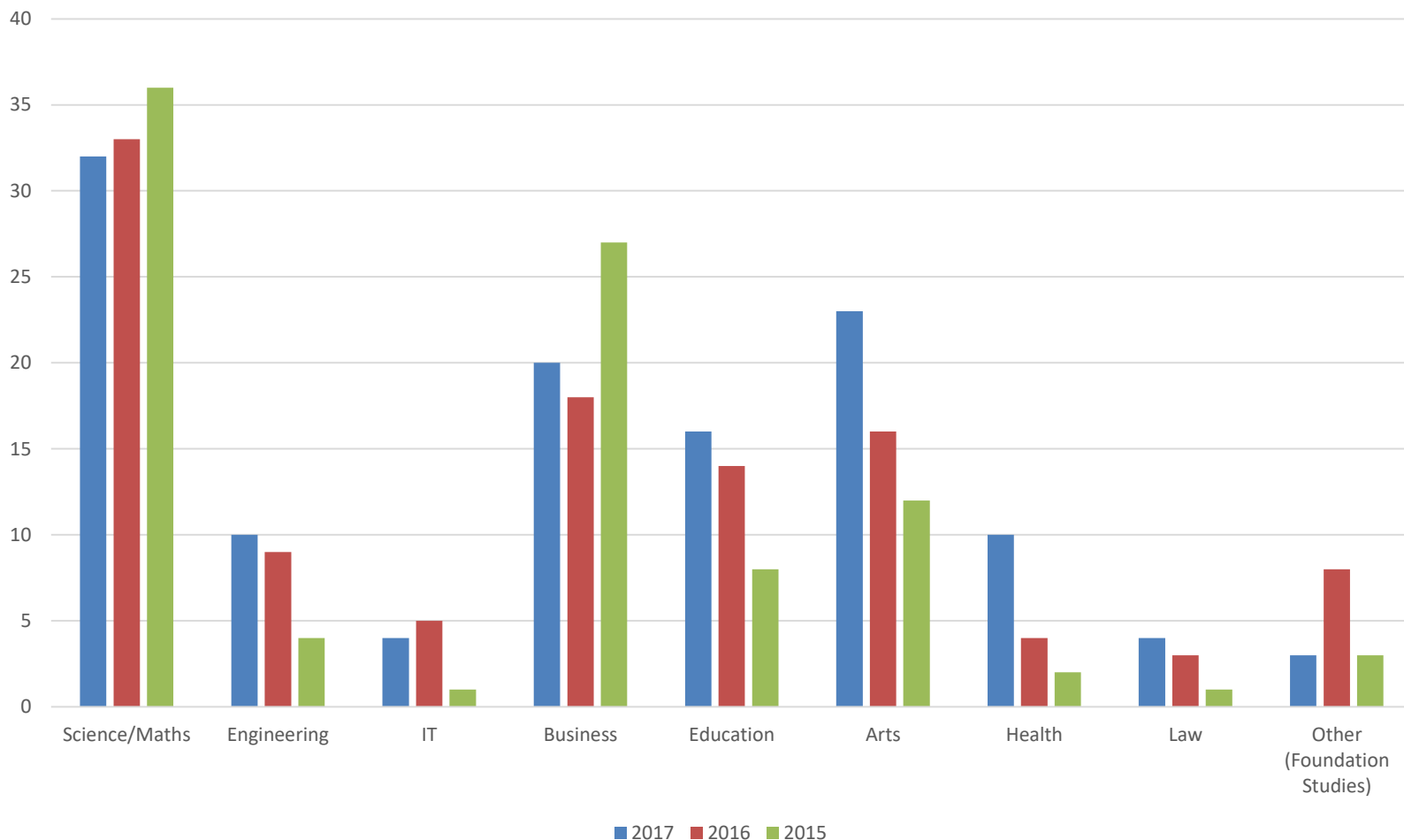
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University offers Henley HS 2015-17

University offers Henley HS



■ 2017 ■ 2016 ■ 2015



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