

The history of science

The periodic table is 150 years old this week

Its creation is a perfect illustration of how science progresses

1 The periodic table of the elements Noble gases 2

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K 39.1	Ca 40.1	Sc 45.0	Ti 47.9	V 50.9	Cr 52.0	Mn 54.9	Fe 55.8	Co 58.9	Ni 58.7	Cu 63.5	Zn 65.4	Ga 69.7	Ge 72.6	As 74.9	Se 79.0	Br 79.9	Kr 83.8
37 Rb 85.5	38 Sr 87.6	39 Y 88.9	40 Zr 91.2	41 Nb 92.9	42 Mo 96.0	43 Tc (97)	44 Ru 101.0	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.8	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
55 Cs 132.9	56 Ba 137.3		72 Hf 178.5	73 Ta 180.9	74 W 183.8	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)		104 Rf (267)	105 Db (270)	106 Sg (269)	107 Bh (270)	108 Hs (270)	109 Mt (278)	110 Ds (281)	111 Rg (281)	112 Cn (285)	113 Nh (286)	114 Fl (289)	115 Mc (289)	116 Lv (293)	117 Ts (293)	118 Og (294)

Lanthanides and actinides

57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
138.9	140.1	140.9	144.2	(145)	150.4	152.0	157.3	158.9	162.5	164.9	167.3	168.9	173.0	175.0
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
(227)	232.0	231.0	238.0	(237)	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(262)

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“**L** *A république n’a pas besoin de savants ni de chimistes.*” With that curt dismissal a court in revolutionary France cut short the life of Antoine-Laurent de Lavoisier, argued by some to be the greatest chemist of all. Lavoisier’s sin was tax farming. He had been a member of the firm that collected the monarchy’s various imposts and then, having taken its cut, passed what remained on to the royal treasury. That he and many of his fellow farmers met their ends beneath a guillotine’s blade is no surprise. What had distinguished Lavoisier from his fellows, though, was what he chose to spend his income on. For much of it went to create the best-equipped chemistry laboratory in Europe.

Nothing comes of nothing. Where the story of the periodic table of the elements really starts is debatable. But Lavoisier’s laboratory is as good a place as any to begin, for it was Lavoisier who published the first putatively comprehensive list of chemical elements—substances incapable of being broken down by chemical reactions into other substances—and it was Lavoisier and his wife Marie-Anne who pioneered the technique of measuring quantitatively what went into and came out of a chemical reaction, as a way of getting to the heart of what such a reaction really is.

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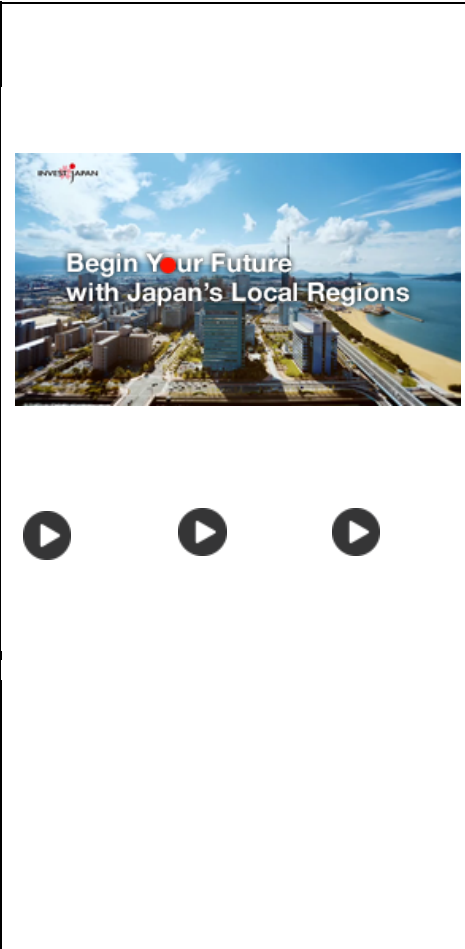
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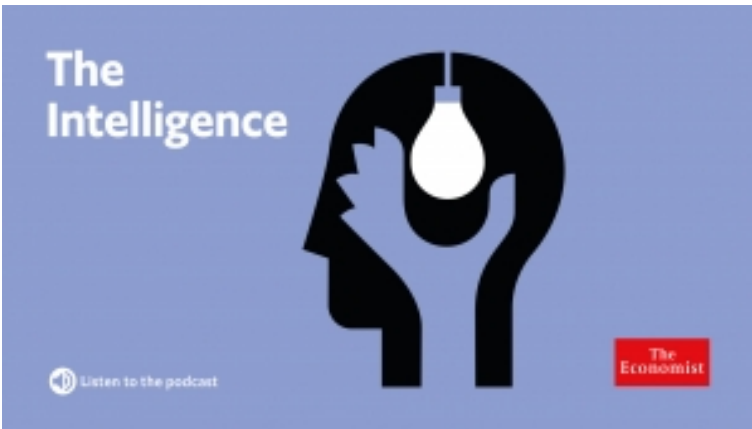
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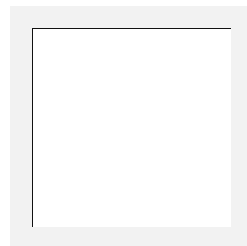
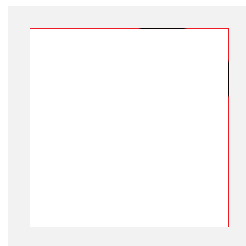
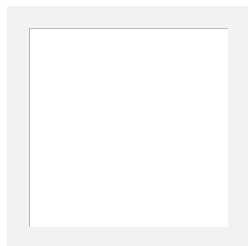
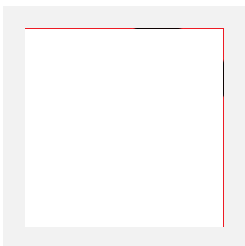
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